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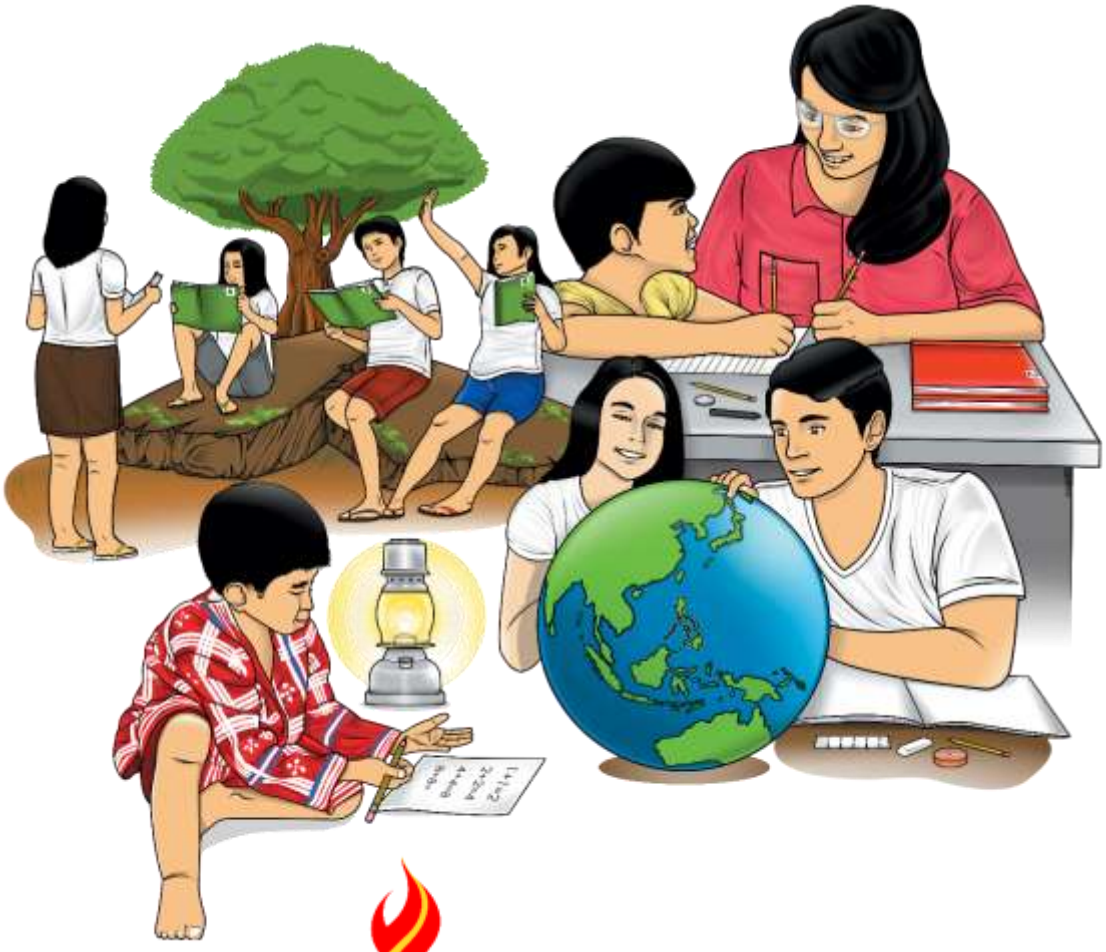
Science

Quarter 4 – Module 8:
Organisms' Interaction



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Development Team of the Module

Writers: Jenile Y. Orias, Adelita I. Escudero, John Rey L. Baradero, Honey R. Bolo, Jocelle B. Bañares
Editor: Teresa May Mundiz
Reviewers: Bernabe L. Linog, Corazon P. Roa, Juvy B. Luna, Arlene L. Abala, Kathyleen S. Torculas, Nonita C. Patalinghug
Illustrators: Jenile Y. Orias and Rosa Mia L. Pontillo
Layout Evaluators: Celeste Faith R. Almanon, Jay S. Ayap, Myleen C. Robiños
Management Team: Francis Cesar B. Bringas
Isidro M. Biol, Jr.
Maripaz F. Magno
Josephine Chonie M. Obseñares
Gregoria T. Su
Marvilyn C. Francia
Jay S. Ayap
Nonita C. Patalinghug

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Department of Education – Caraga

Office Address: Teacher Development Center
J.P. Rosales Avenue, Butuan City, Philippines 8600
Telefax: (085) 342-8207/ (085) 342-5969
E-mail Address: caraga@deped.gov.ph

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Science

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Organisms' Interaction

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

This module was designed and written with you in mind. It is here to help you master the nature of Living Things and Their Environment. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the Learner's Material you are now using.

The module is divided into three lessons, namely:

- **Lesson 1** – Food Chain
- **Lesson 2** - Food Web
- **Lesson 3** – Food Pyramid: Transfer of Energy in the Trophic Level

After going through this module, you are expected to:

1. Describe a food chain;
2. Create a simple food chain;
3. Classify organisms as herbivore, carnivore and omnivore;
4. Describe a food web;
5. Create a food web;
6. Identify organism as to its trophic level;
7. Construct an energy pyramid and label each trophic level;
8. Illustrate the transfer of biomass and energy at each trophic level in the food pyramid;
9. Differentiate between vegetable eaters and meat eaters; and
10. Describe the transfer of energy through the trophic levels (MELC Week 5 S8LT-IVi-22)

What I Know

Directions: Choose the letter of the correct answer. Write your answers on a separate sheet of paper.

1. Which of the following is a producer?
   A. Rabbit
   B. Rat
   C. Rattlesnake
   D. Rice

2. Which of the following is NOT an abiotic factor of an ecosystem?
   A. Plant
   B. Rock
   C. Sunlight
   D. Water

3. Which of the following organisms is a top predator?
   A. Grasshopper
   B. Hawk
   C. Mouse
   D. Spider

4. Which of the following refers to the producers in the ecosystem?
   A. Autotrophs
   B. Carnivores
   C. Heterotrophs
   D. Omnivores

5. If there is a 50 kcal of energy in the third trophic level, how much energy in kcal was available at the first trophic level?
   A. 5 kcal
   B. 50 kcal
   C. 500 kcal
   D. 5,000 kcal

6. In the food chain: grass ⟶ grasshopper ⟶ frog ⟶ snake ⟶ eagle, what organism is the primary consumer?
   A. Frog
   B. Grass
   C. Grasshopper
   D. Snake

7. Which of the following eats plants?
   A. Decomposer
   B. Producer
   C. Primary consumer
   D. Secondary consumer

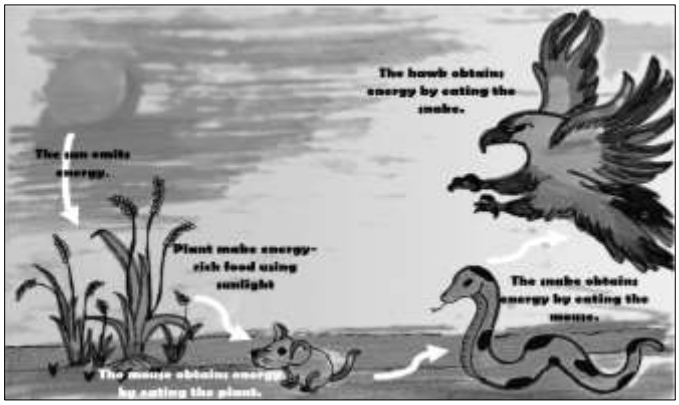
8. At which level does the path of nutrients start?
   A. Producer at the first trophic level
   B. Consumer at the second trophic level
   C. Consumer at the topmost trophic level
   D. Decomposer at the top most trophic level

9. Which statement describes the Law of Degradation of Energy?
   A. Energy at the producer level is greater than at the second trophic level.
   B. Equal amount of energy is transferred at each trophic level until the top.
   C. The quality of energy transferred to the higher trophic level is changed irreversibly.
   D. The same amount of energy is restored at the second trophic level as in the first.

10. Which of the following is a producer?
   A. Fungi
   B. Larvae
   C. Phytoplankton
   D. Zooplankton

11. Which is true about organisms at the highest trophic level in an energy pyramid?
   A. They are the producers.
   B. They are the first order consumers.
   C. They have the least amount of energy.
   D. They have the greatest amount of energy.

12. A snake is waiting for its prey, a mouse. In which trophic level in the feeding process would the snake be placed?



Illustrated by: Jenile Y. Orias

   A. First trophic level
   B. Second trophic level
   C. Third trophic level
   D. Top trophic level

13. You love to eat meat, while your sibling loves to eat vegetables. Who would have more energy acquired from the consumed food?
   A. You, since meat is made up of protein.
   B. My sibling because vegetables are producers.
   C. It depends on the amount of food consumed.
   D. We gained equal energy from the same amount of food that we ate.

14. What is the important role of producers in a food chain?
   A. They block the flow of energy in a food chain.
   B. They consume other organisms to obtain energy.
   C. They serve as the main source of food for the consumers.
   D. They keep the animal population at a reasonable number.

15. What will happen if grains, fruits and vegetables are removed from the feeding process?
    A. The feeding process will continue.
    B. The feeding process remains constant.
    C. There will be no more food chain and food web.
    D. The food chain and food web will utilize animals as producers.

Lesson 1 Food Chain

The flow of energy among organisms is linear. Energy flows from the sun to the autotrophs such as corn plants, and to heterotrophs such as chicken and lizards. Autotrophs get energy from the sun to produce food molecules, hence are the producers. Dependent species cannot make their own food and are called **heterotrophs or consumers,** which obtain energy by eating or consuming plants and animals. The kind of organisms in an ecosystem determines the flow of energy. The linear feeding process of organisms beginning with producers and ending at the apex consumer is called the **food chain**.

What's In

In Grade 7, you have learned about plants, animals and some kinds of bacteria. Let us have a quick review!

Activity 1. Remember Me!

Directions: Write **TRUE** if the statement is correct, and **FALSE** if the statement is wrong. Write your answers on a separate sheet of paper.

_____1. The food chain shows the relationship between organisms based on their feeding styles.
_____2. A producer is also called autotroph.
_____3. Herbivores eat animals.
_____4. Omnivores feed on both plants and animals.
_____5. First order consumers are known as herbivores.

What's New

Activity 2. Understanding Food Chain!

Directions: Group the following organisms according to their classification in the feeding process. Complete the table below by indicating the name of the organisms. Write your answers on a separate sheet of paper.


Corn Plant


grasshopper


Rice Plant


Snake


Owl


Rat

Illustrated by: Jenile Y. Orias

Producer	Primary Consumer	Secondary Consumer	Tertiary Consumer

What is It

The living part of an ecosystem consists of different species of organisms. Each species is part of the ecosystem's population. The population in an ecosystem, taken together, makes up a community.

The main source of energy in a community is the sun as shown in Figure 1. Plants use sunlight, with carbon dioxide and water, to make food through the process of photosynthesis. Plants can manufacture and produce their own food, hence they are called **producers**. When an animal, such as a mouse, eats plants, it gets some of

the plants' energy. Animals depend on plants because they cannot produce their own food that's why they are called **consumers**.

Any organism that feeds on other organisms, including producers is called a consumer. Organism that feeds directly on the producers is called the **first-order consumer**. Organism that eats the first-order consumer is referred to as the **second-order consumer**, while those that eat the second-order consumers are the **third-order consumers** and so on.

These orders of consumers, together with the producers, constitute the **trophic levels**, or level of energy transfer. Those organisms at the top most trophic level in the pyramid are called **apex consumers**.

Organisms can also be classified according to the type of food they eat. Those that feed solely on plants, vegetables and fruits are called **herbivores**, while those that feed on other animals are called **carnivores**. Carnivores feed on herbivores, omnivores and other carnivores. Some feed on both plants and animals, and are called **omnivores**. Other organisms feed on dead plants and animals, and the smaller pieces of organic matter provided by scavengers. They are called **decomposers**. However, there are organisms that feed on dead, decaying flesh of an animal, dead plant materials, or refuse, to break down their organic materials into smaller pieces. They are **scavengers**.

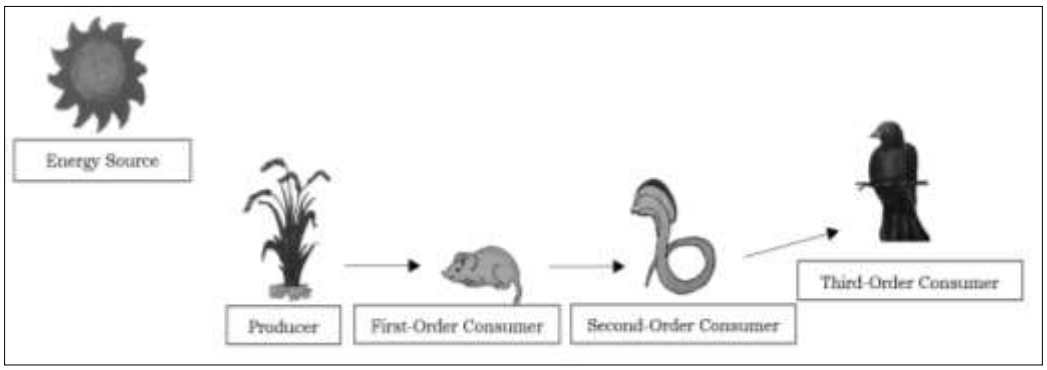
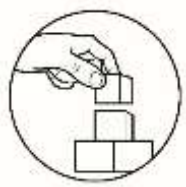


Figure 1. Diagram of a Food Chain
Illustrated by: Jenile Y. Orias



What's More

Activity 3. Respond to Me!

Directions: Using figure 1, answer the following questions. Write your answers on a separate sheet of paper.

1. What is the main source of energy of all organisms? _____
2. What will happen if the producer in the food chain dies? _____

Activity 4. What Am I?

Directions: Match column A with column B. Write the letter of your answers on a separate sheet of paper.

Column A	Column B
1. Decomposer	A. Bacteria
2. Energy Source	B. Hawk
3. Primary Consumer	C. Rat
4. Producer	D. Rice Plant
5. Secondary Consumer	E. Snake
6. Tertiary Consumer	F. Sunlight

Activity 5. Shape It Out!

Directions: Make a diagram of a food chain in a grassland biome using the list of organisms in the box and put arrows pointing towards the organism that will consume the one at the end tail of the arrow. Then, answer the questions that follow. Write your answers on a separate sheet of paper.

Carabao grass	Grasshopper	Frogs	Snake

Scoring Rubrics:	
Points	**Description**
4	The illustration shows a simple food web with correct sequencing and labeling.
3	The illustration shows a simple food web but with not more than two incorrect sequencing or labeling.
2	The illustration shows a simple food web but with more than two incorrect sequencing or labeling.
1	The illustration does not show a correct food web.
0	No illustration was given

Questions:

Which organism is the:

1. Producer? _____
2. Primary consumer? _____
3. Secondary Consumer? _____
4. Tertiary consumer? _____

Activity 6. Can You?

Directions: Read the situation below and answer the questions that follow. Write your answers on a separate sheet of paper.

> One early morning, Jen and her friends decidedly went out to a water garden pond to watch the beautiful waterlilies afloat the water. While looking at the flowers, they spotted a few damaged lily pads around! It seemed that something has been chewing on them. The girls meticulously observed one of the big leaves and suddenly they noticed a small water beetle showing up at the side. It was slowly ravaging the pad! They were still in full awe of the situation when a small frog swiftly hopped from one of the pads, stuck out its tongue and caught the beetle! That is not all. When the frog was about to dive back to the water, a medium-sized Orfe fish leaped out of the water and swallowed the frog! It was such a sudden spectacular sight! The girls ran hurriedly back home, eager to share their amazing experience to the rest of their friends.

1. Base on the situation, which organism is considered as the secondary consumer? _____
2. Among the organisms in the selection, which is an herbivore? _____

What I Have Learned

Activity 7. Complete Me!

Directions: Complete the statement by writing the appropriate word or phrase on the blank. Write your answers on a separate sheet of paper.

1. A _____ shows a simple linear series of organisms that shows the feeding pattern of animals.
2. The _____ are heterotrophic organisms that cannot make their own food.
3. The _____ can make their own food and begin the food chain.
4. Herbivores feed on _____ while carnivores eat _____.
5. Omnivores feed on both _____ and _____.
6. Those that feed on dead or decaying organisms are called _____.
7. The arrow indicates the flow of _____ from one organism to the next.
8. The arrow tail is close to the organism that will be _____.

What I Can Do

Activity 8. Form Me!

Directions: Form a simple food chain in the given ecosystems using the organisms in the box and put arrows pointing at the organism doing the feeding. Write your answers on a separate sheet of paper.

Birds	Caterpillar	Chicks	Eagle	Flower
Phytoplanktons		Owl	Shark	Small Fish

Land Ecosystem	Aquatic Ecosystem

Scoring Rubrics	
Points	**Description**
4	The illustration shows a simple food web with correct sequencing and labeling.
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1	The illustration does not show a correct food web.
0	No illustration was given

Additional Activity

Activity 9. Where Do I Belong?

Directions: In each category, write in the table below two or more organisms found within your community. Write your answers on a separate sheet of paper.

Producers	First-Order Consumers	Second-Order Consumers	Third Order Consumer

Lesson 2 Food Web

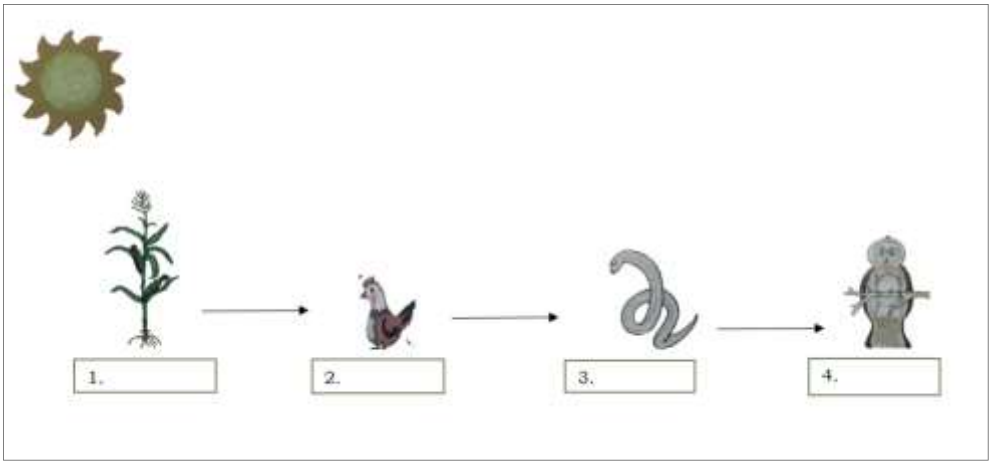
An ecosystem can be explained by a single food chain. However, a **food web**, which shows the network of food chains, more accurately represents the feeding relationships among organisms in an ecosystem.

What's In

In Lesson 1 Food Chain, you have learned the role of each organism in an ecosystem. Let us have a quick review!

Activity 1. Identify Me!

Directions: Identify the role of each organism in the food chain below as: ***producer, first-order consumer, second-order consumer, third-order consumer and decomposer.*** Write your answers on a separate sheet of paper.



Illustrated by: Jenile Y. Orias

What's New

Activity 2. Find Me!

Directions: Copy the box containing the jumbled letters in a separate sheet of paper. Encircle the given words in the puzzle. The words may appear straight across, up and down, or down and up.

1. Bacteria	2. Herbivores	3. Omnivores	4. Organisms
5. Plants	6. Trophic		

H	O	R	G	A	N	I	S	M	S
E	A	B	C	D	S	U	P	T	S
R	E	F	G	H	E	V	L	Q	R
B	A	C	T	E	R	I	A	P	N
I	I	J	R	K	O	L	N	M	O
V	W	X	O	Y	V	Z	T	A	B
O	G	F	P	E	I	D	S	C	V
R	H	I	H	J	N	K	L	M	N
E	B	Y	I	X	M	R	Q	P	O
S	A	Z	C	W	O	S	T	U	V

Note to the Teacher

Provide extra copies of the puzzle for the students' use.

What is It

A **food web** shows an interlocking pattern of food chains. It allows one to see the precise feeding relationship among populations. It is very rare for an organism to feed only on one type of food. Most of the time, carnivores eat other carnivores, as well as herbivores as shown in Figure 2 below. Some may even eat both animals and plants. If we list every species that is present in an ecosystem and then draw arrows connecting them to each of their food sources, we would see many interlocking arrows that would give the appearance of a spider web. We call the entire complex array of feeding relationship in an ecosystem as a food web.

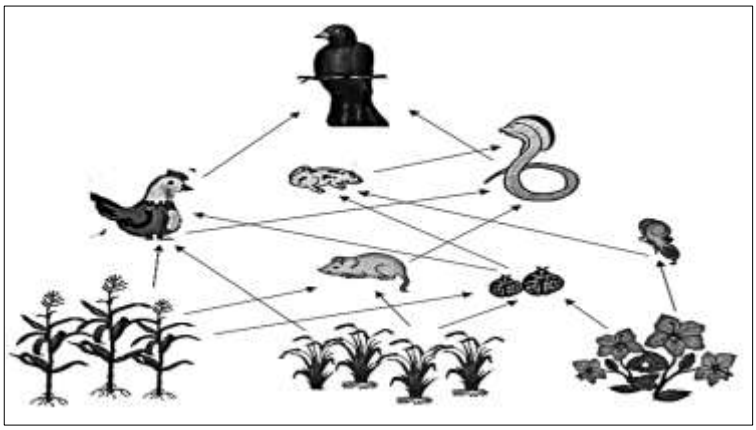
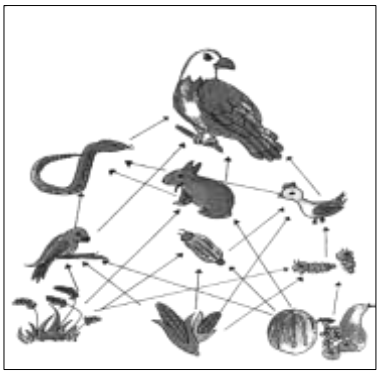


Figure 2. Diagram of a Food Web
Illustrated by: Jenile Y. Orias

What's More

Activity 3. Label Up!

Directions: Trace a simple food chain from the given food web below that includes the identified organisms. Then, determine their role as producer, first-order consumer, second-order consumer and third-order consumer. Write your answers on a separate sheet of paper.

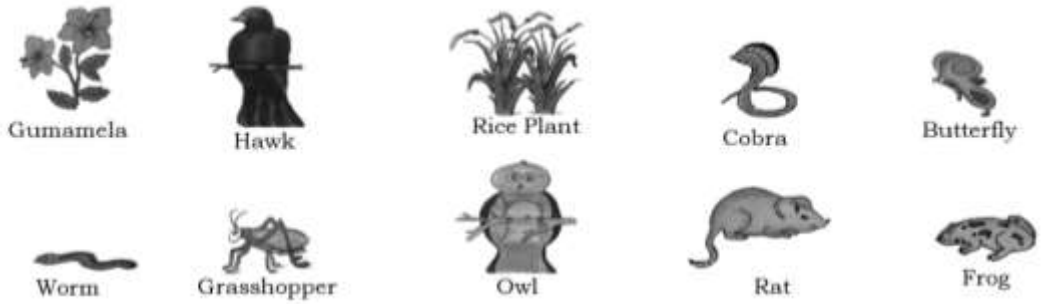


Illustrated by: Jenile Y. Orias

1. Eagle _____
2. Snake _____
3. Rabbit _____
4. Corn _____

Activity 4. You Can Do It!

Directions: Construct a food web using the following organisms below. Write your answers on a separate sheet of paper.



Illustrated by: Jenile Y. Orias

Scoring Rubrics:	
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2	The illustration shows a simple food web but with more than two incorrect sequencing or labeling.
1	The illustration does not show a correct food web.
0	No illustration was given

What I Have Learned

Activity 5. Complete Me!

Directions: Read carefully and complete each statement below. Write your answers on a separate sheet of paper.

1. A _____ shows an interlocking pattern of food chains.
2. The herbivores feed on producers at _____ trophic level.
3. The carnivores feed on herbivores at_____ trophic level.
4. The omnivores feed on both _____ and _____
5. Scavengers feed on _____ organisms.
6. The carnivorous animals is on the _____ trophic level.

What I Can Do

Activity 6. Show Me!

Directions: Illustrate a simple food web from the various organisms that you know of, or relationships of organisms that you see in your surroundings. Write your answers on a separate sheet of paper.

Scoring Rubrics:	
Points	**Description**
4	The illustration shows a simple food web with correct sequencing and labeling.
3	The illustration shows a simple food web but with not more than two incorrect sequencing or labeling.
2	The illustration shows a simple food web but with more than two incorrect sequencing or labeling.
1	The illustration does not show a correct food web.
0	No illustration was given

Additional Activities

Activity 7. Form Me!

Directions: Make a simple food web in a marine ecosystem using the organisms in the box and put arrows pointing at the organism doing the feeding. Write your answers on a separate sheet of paper.

Anchovies	Crabs	Fish larvae
Lapu-lapu (matured)	Mackerel	Phytoplanktons
Salmon Fingerlings	Sea Grass	Shark
Shrimps	Squids	Zooplanktons

Scoring Rubrics:	
Points	**Description**
4	The illustration shows a simple food web with correct sequencing and labeling.
3	The illustration shows a simple food web but with not more than two incorrect sequencing or labeling.
2	The illustration shows a simple food web but with more than two incorrect sequencing or labeling.
1	The illustration does not show a correct food web.
0	No illustration was given

Lesson 3 Food Pyramid: Transfer of Energy in Trophic Level

Food chain is the simple diagram that shows feeding path of organisms.

Food web is the inter-connections of the food chains. In this interrelationship, several consumers may eat the same organism or consumers may have a choice of several organisms to consume.

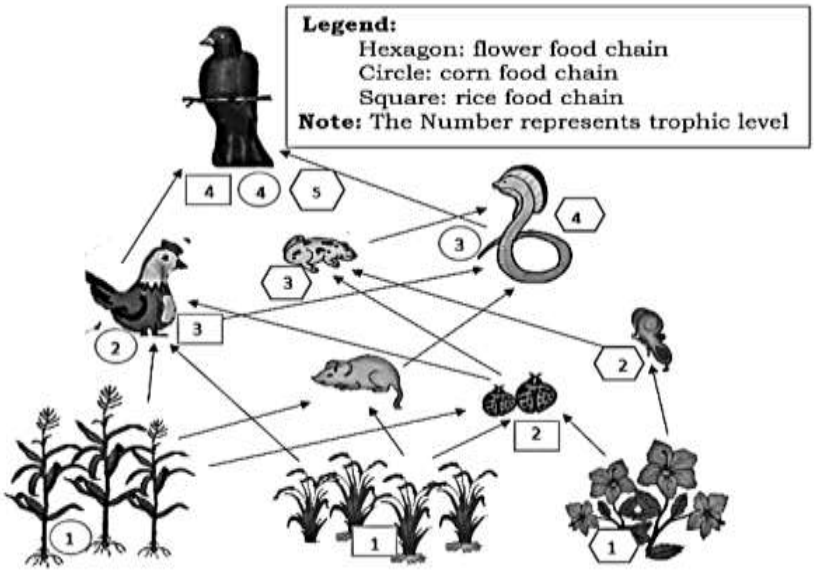


Figure 3. Food Chains in a Web
Illustrated by: Jenile Y. Orias

What's In

In Lesson 2 Food Web, the interconnectedness of food chains in a web was discussed and illustrated. Let us have a quick review!

Activity 1. Answer Me!

Directions: Choose letter of the best answer and write your answers on a separate sheet of paper.

1. What is the important role of flowers, vegetables and rice in a food web?
   A. They block the flow of energy in a food chain.
   B. They consume other organisms to obtain energy.
   C. They are the main source of food for the consumers.
   D. They keep the animal population at reasonable number.

2. Will consumers survive without producers? Why are producers important in the food chain/web?
   A. It uses sunlight, water, and carbon dioxide to make organic food for others.
   B. It has the highest energy consumed from the sun.
   C. It provides food for all carnivorous animals.
   D. It increases the number of top predators in an ecosystem.

What's New

Food Pyramid

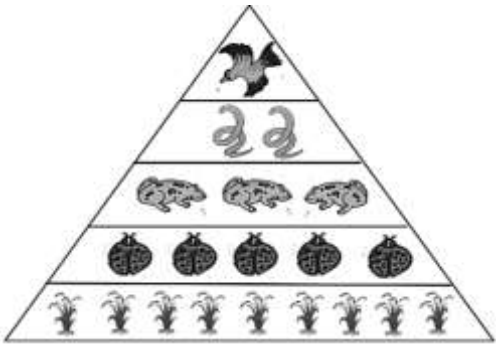
The sun is the source of energy which is being converted into biomass by the plants. As trophic level in the food pyramid increases, the biomass decreases.

There should be stability in the environment to sustain and recycle biomass. The decreasing number of plants usually can cause the drop of plant-eater population due to scarcity of food. Human activities such as illegal logging, fishing and mining, as well as the conversion of agricultural and forest lands into industrial or residential uses can threaten the stability of the environment.

In the food pyramid, the producers such as plants start the first trophic level, ~~to~~ plant-eaters at second trophic level, animal eaters at third trophic level or succeeding levels. The pyramid usually ends with the apex consumer.

Activity 2. Know Me!

Directions: Identify the trophic level of the given organisms. Write your answers on a separate sheet of paper.



Illustrated by: Jenile Y. Orias

Trophic Level	Organism
	Beetles
	Frog
	Hawk
	Rice

What is It

Rice plants are autotrophs that trap light energy from the sun and manufacture their own food through the process of photosynthesis. In Activity 2, Know My Name!, the food pyramid shows that grasses serve as food for the beetles (first-order consumer); beetles are eaten by frogs (second-order consumers); frogs are consumed by snakes (third-order consumers); finally, the eagle eats the snakes (fourth-order consumer). The eagle becomes the apex predator or top consumer in the trophic level.

The transfer of matter expressed as biomass and the transfer of food energy from one trophic level to another is not 100%. Biomass is the total mass of organic molecules minus water of an organism in a food chain and food web. The organisms consuming plants or animals at the next level do not consume all parts of a plant or animal. There are some that are difficult to digest or are not edible. For example, bones, wood, shells and some fruits and seed. In addition, much of the energy is used by the plant or animal for their different functions and some are lost as heat. Only about 10% of energy are transferred to the next level. A biomass pyramid and an energy pyramid demonstrate the relationship between producers and consumers.

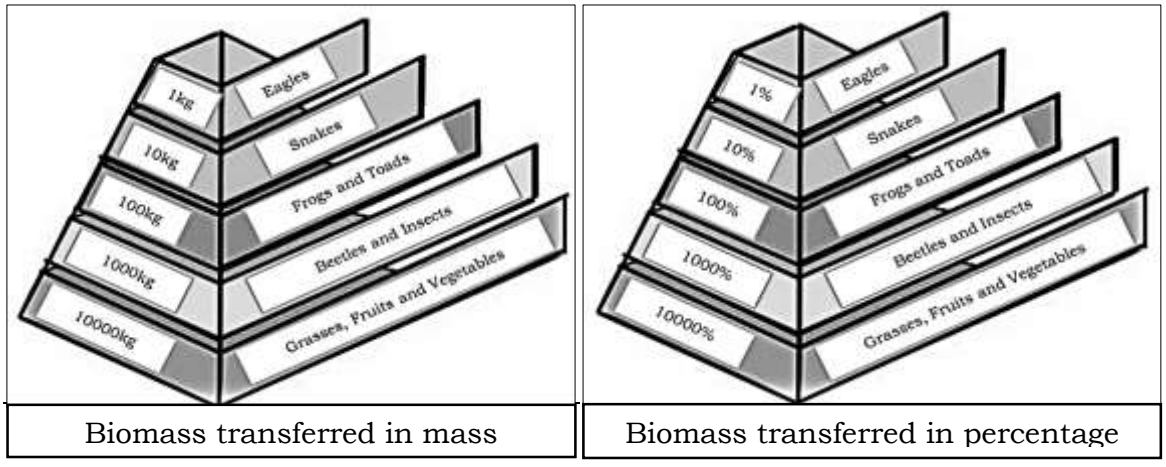
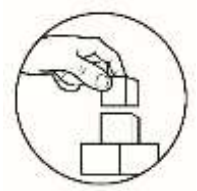


Figure 4. Biomass transferred in Mass and Percentage Across Energy Levels
Illustrated by: Jenile Y. Orias



What's More

Activity 3. Catch and Eat Me If You Can!

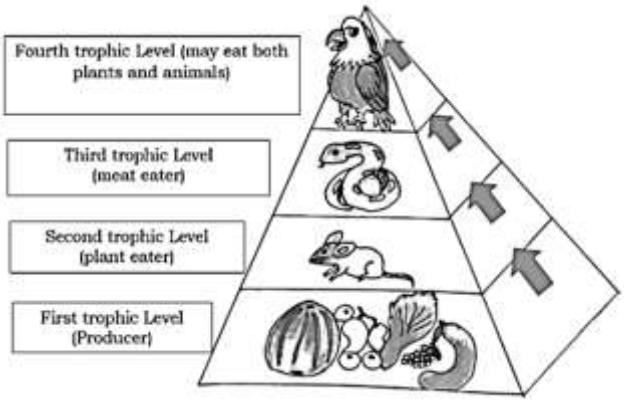
Directions: Refer to the sample food pyramid below and answer the questions that follow. Write your answers on a separate sheet of paper.

1. What organism/s is/are at the:
   First trophic level? _____

   Second trophic level? _____

   Third trophic level? _____

   Fourth trophic level? _____

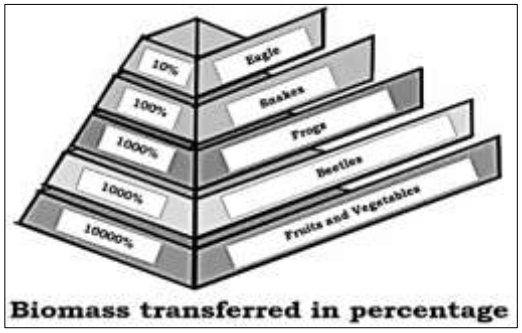


Illustrated by: Jenile Y. Orias

2. If the rat consumes 100 grams of vegetables, how much biomass is transferred to it? _____
3. The eagle may be able to land on twigs and branches of large trees in the forest where it can feed on other organisms that has feed on the tree. In which trophic level can you place the eagle in this scenario? _____

Activity 4. Let it Flow, let it Go!

Directions: Use the illustrations to answer the questions below. Write your answers on a separate sheet of paper.



Illustrated by: Jenile Y. Orias

1. Which organism has the:
   a. greatest biomass? _____
   b. greatest energy? _____
   c. least biomass received? _____
   d. % of energy gained by frogs? _____

2. What happens to the amount of biomass from the bottom to the top of the pyramid? _____

3. Why are the producers always placed at the base of the pyramid?
_____

Scoring Rubrics for item number 3.
3: Discussions do not have misconceptions with complete scientific evidence.
2: Discussions do not completely show scientific evidence.
1: Discussions do not show complete scientific evidence with misconception.
0: No discussions at all.

Activity 5. Veggies Overload!

Directions: Use the illustrations below to answer the questions that follow. Write your answers on a separate sheet of paper.

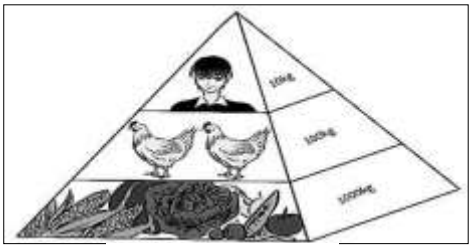


Illustration A

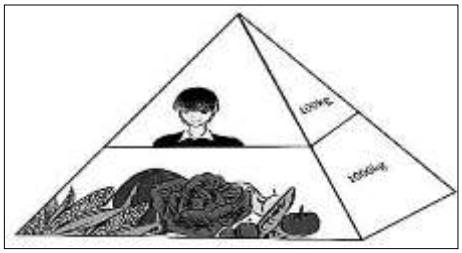


Illustration B

Illustrated by: Rosa Mia L. Pontillo

1. How much biomass can the human get from a 500-kg chicken? _____
2. How much biomass can be transferred to the chicken from 2,000 kg fruits and vegetables? _____
3. If the human consumes 3,000 kcal of fruits and vegetables, how much energy is transferred to him? _____
4. In which illustration can human get the most energy? _____

What I Have Learned

Activity 6. Fill Me!

Directions: Read each statement below and fill in the blanks with the correct answer. Write your answers on a separate sheet of paper.

1. The _____ is the total dry mass of organisms in a food chain and food web.
2. The main source of energy in the ecosystem is the _____.
3. As energy is transferred from one trophic level to another, it diminishes. Only about _____ % of biomass and energy is transferred to the next level.
4. Organisms may be classified as _____ (plant eaters), carnivores (meat eaters), or _____ (both plant and meat eaters).

What I Can Do

Activity 7. Do This!

Directions: Do what is asked. Write your answers on a separate sheet of paper.

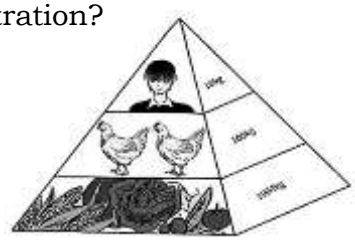
1. Construct a food pyramid using the following organisms:
   grasshoppers, grasses, hawk and snake.
2. Which do you think gains lesser energy; a meat-eater or a vegetable-eater? Explain your answer. _____
3. Is it possible to have an inverted pyramid, one with more organisms at the top than at the bottom? Explain your answer.

Scoring Rubrics:	
Points	**Description**
4	The illustration shows a simple food web with correct sequencing and labeling.
3	The illustration shows a simple food web but with not more than two incorrect sequencing or labeling.
2	The illustration shows a simple food web but with more than two incorrect sequencing or labeling.
1	The illustration does not show a correct food web.
0	No illustration was given

Assessment

Directions: Read and analyze each question. Choose the correct answer. Write your answers on a separate sheet of paper.

1. How much biomass from 100 kg of chicken can be transferred to the consuming human in the illustration?
   A. 1kg
   B. 10 kg
   C. 100 kg
   D. 1000 kg



Illustrated by: Rosa Mia L. Pontillo

2. The following practices should be observed in order to sustain feeding process in the ecosystem EXCEPT:
   A. Raise animals and insects to fight other pests.
   B. Dump organic wastes into rivers and streams.
   C. Grow a variety of crops instead of only one crop.
   D. Use organic fertilizers instead of chemical fertilizers.

3. Which of the following explains why fruits and vegetables eaters are energy efficient?
   A. They do not used energy at all.
   B. They burn much of their energy in a day.
   C. They directly derive energy from the producer level.
   D. They get their energy from first degree consumer level.

4. Food chain is characterized as simple illustration of who eats and follows
   A. One path
   B. Two paths
   C. Three paths
   D. Four paths

5. Which of the following organisms will a first-order consumer eat?
   A. Giraffes
   B. Goats
   C. Grasses
   D. Grasshoppers

6. Which of the following shows the correct sequence of feeding relationships in a food chain?
   A. Grasses → Grasshoppers → Frogs → Snakes → Eagle
   B. Grasshoppers → Grasses → Frogs → Snakes → Eagle
   C. Frogs → Snakes → Eagle → Grasses → Grasshoppers
   D. Snakes → Eagle → Frogs → Grasses → Grasshoppers

7. Which consumer in a trophic level can eat both plants and animals?
   A. Carnivores
   B. Decomposers
   C. Herbivores
   D. Omnivores

8. Which statement **does not** describe the Law of Degradation of Energy?
   A. Much of the energy from the food consumed is converted into heat.
   B. Only 10% of energy is transferred to the consumer at any trophic level.
   C. A lesser amount of energy is transferred from one trophic level to another.
   D. The same amount of energy is restored at the second trophic level as in the first.

9. If there are 600 kg of biomass at the third trophic level, how much biomass was available at the first trophic level?
   A. 60 kg
   B. 600 kg
   C. 6,000kg
   D. 60,000kg

10. Which is NOT true about organisms at the highest trophic level in an energy pyramid?
   A. They are apex consumers.
   B. They can be meat and vegetable eater.
   C. They get the least amount of energy.
   D. They get the greatest amount of energy.

11. If there are 100,000 kilocalories of energy in the first trophic level, how many kilocalories are available to organisms in the second trophic level?
   A. 100 kilocalories
   B. 1000 kilocalories
   C. 10,000 kilocalories
   D. 100,000 kilocalories

12. Which of the following organisms are placed at the base of the energy pyramid?
   A. Carnivores
   B. Decomposers
   C. Omnivores
   D. Producers

13. What will happen if producers are removed from the feeding process?
    A. The feeding process will continue.
    B. The feeding process remains constant.
    C. The food chain and food web will not be possible.
    D. The food chain and food web will utilize animals as producers.

14. Which consumer helps the recycling of nutrients?
    A. Carnivore
    B. Decomposer
    C. Herbivore
    D. Omnivore

15. What is the important role of carnivores in a food chain?
    A. They consume only plants to obtain energy.
    B. They block the flow of energy in a food chain.
    C. They serve as the main source of food for the consumers.
    D. They control the population of other consumers at a reasonable number.

Additional Activities

Activity 8. Solve Me!

Directions: Read carefully the questions below and supply what is asked. Write your answers on a separate sheet of paper.

1. If there are 10,000 kg of biomass in the first trophic level, how much biomass are available to organisms in the succeeding trophic levels?

   First trophic level: 10,000 kg
   Second trophic level: _____
   Third trophic level: _____
   Fourth trophic level: _____

2. As a student what desirable activities can you suggest to maintain the balance in the ecosystem? _____

Scoring Rubrics for item number 2.
3: Discussions do not have misconceptions with complete scientific evidence.
2: Discussions do not completely show scientific evidence.
1: Discussions do not show complete scientific evidence with misconception.
0: No discussions at all.

Answer Key

Lesson 1: Food Chain

What I Know

1. D 2. A 3. B 4. A 5. D 6. C 7. C 8. A 9. D 10. C 11. C
12. B 13. B 14. C 15. C

What's In
Activity 1. Remember Me!

1. True 2. True 3.False 4. True 5.True

What's New
Activity 2. Understanding Food Chain!

Producer	Primary Consumer	Secondary Consumer	Tertiary Consumer
Corn Plant	Grasshopper	Snake	Owl
Rice Plant	Rat		

What I have learn
Activity 7. Complete Me!

1.Food Chain 2. Consumers 3. Producers/Autotroph
4. Plants/plant products and animal's/animal products 5. Plants/animals 6. Decomposers 7. Feeding
8. eaten or consumed

What I can Do
Activity 8. Form Me! (Possible answers)

1. Land Ecosystem

Flower--> Caterpillar--> chicks -->Owl

2. Water Ecosystem

Green Algae -> Small Fish -> Sharks

Additional Activities
Activity 9. Where Do I Belong?
(Possible answers)

Producers	**First Order Consumers**	**Second Order Consumers**	**Third Order Consumers**
Plants /Fruits	Worms /insects	Frogs	Snake
Flowers	Birds /chicks	Snakes	owl

What's More
Activity 3. Respond to Me!

1. Sunlight/Sun
2. The Feeding process will collapse/The food chain will stop existing.

Activity 4. What Am I?

1. A 2. F
3. C 4. D
5. E 6. B

Activity 5. Shape It Out!

(Possible Answer)

Carabao grass→
Grasshoppers→ Frog→Snake

Questions:

1. Carabao grass
2. Grasshoppers
3. Frog
4. Snake

Activity 6. Can You?

1. water beetle
2. frog

Lesson 2: Food Web

What's In

Activity 1. Identify Me!

1. Producer (Autotrophs)
2. First-order Consumer(s) (Herbivores)
3. Second-order Consumer(s) (Carnivores)
4. Third-order Consumer(s) (Omnivores)
5. Decomposer(s) (Detritivores)

What's New

Activity 2. Find Me!

H	O	R	G	A	N	I	S	M	S
E	A	B	C	D	S	U	P	T	S
R	E	F	G	H	E	V	L	Q	R
B	A	C	T	E	R	I	A	P	N
I	I	J	R	K	O	L	N	M	O
V	W	X	O	Y	V	Z	T	A	B
O	G	F	P	E	I	D	S	C	V
R	H	I	H	J	N	K	L	M	N
E	B	Y	I	X	M	R	Q	P	O
S	A	Z	C	W	O	S	T	U	V

What Can I Do

Activity 6. Show Me!

(Possible answers)

Additional Activities:

Activity 7. Form Me!

(Possible answer)

What's more

Activity 3. Label Up!

1. Third- order Consumers
2. Second-order Consumers
3. First-order Consumers
4. Producers

Activity 4. You Can Do It!

(Possible answers)

What I Have Learned:

Activity 5. Complete Me!

1. Food Web
2. First Trophic Level
3. Second Trophic Level
4. Plants and Animal
5. Dead
6. Top /last Trophic Level

Lesson 3: Food Pyramid

Assessment:

1. B	6. A	11. C
2. B	7. D	12. D
3. C	8. D	13. C
4. A	9. D	14. B
5. C	10. D	15. D

What I Have Learned

Activity 6. Fill me

1.biomass 2. sun
3. 10% 4. herbivore/omnivores

What I can do

Activity 7. Do Me!

(Possible answers)

First trophic level- grasses
Second trophic level- grasshoppers
Third trophic level- snake
Fourth trophic level- hawk

1. Person who is meat eater gains lesser energy.
2. Yes, when there is lesser number of producers than consumers the pyramid becomes inverted, which actually result to food shortage.

Additional Activities

Activity 8. Solve Me!

(Possible answers)

1. First trophic level:
   10,000 kilocalories
   Second trophic level:
   1,000 kilocalories
   Third trophic level:
   100 kilocalories
   Fourth trophic level:
   10 kilocalories
2. Tree planting, reforestation, stop illegal fishing, Segregation of waste, No to mining activities and conversion of agricultural lands, forest to infrastructures. Using chemical fertilizers and pesticides is prohibited. Be an agent/steward of nature.

What's In

Activity 1. Answer Me!

1. C 2. A

What's New

Activity 2. Know Me!

1. Second trophic level
2. Third trophic level
3. Apex/ Top trophic level
4. First trophic level

What's More

Activity 3. Catch and Eat Me If You Can!

1. Fruits and Vegetables
   Rat
   Snakes
   Eagle
2. 10 grams
   3rd trophic level

Activity 4. Let it Flow, Let it Go!

(Possible answers)

1. Fruits and Vegetable
   Fruits and Vegetables
   Eagle the top consumer
   100%
2. The amount of biomass diminishes or decreases at each succeeding trophic level from the base (bottom part) to the topmost trophic level of the pyramid.
3. Because the area of the base is reflective of the amount of energy and biomass of plants

Activity 5. Veggies Overload!

1. 50 kg
2. 200 kg
3. 300 kcal
4. B human who eats vegetables

References

Development Team of the Learner's Guide, *Grade 8 Science Learner's Module* Pasig City, Philippines: Vibal Publishing House, Inc, DepEd, First Edition, 2013. p. 273-284.

Lourdes R. Carale, et. Al., *Science and Technology II SEDIP Biology Textbook* Quezon City Philippines: ISMED, Revised Edition 2004, p. 75-86.

For inquiries or feedback, please write or call:

Department of Education - Bureau of Learning Resources (DepEd-BLR)

Ground Floor, Bonifacio Bldg., DepEd Complex
Meralco Avenue, Pasig City, Philippines 1600

Telefax: (632) 8634-1072; 8634-1054; 8631-4985

Email Address: blr.lrqad@deped.gov.ph * blr.lrpd@deped.gov.ph