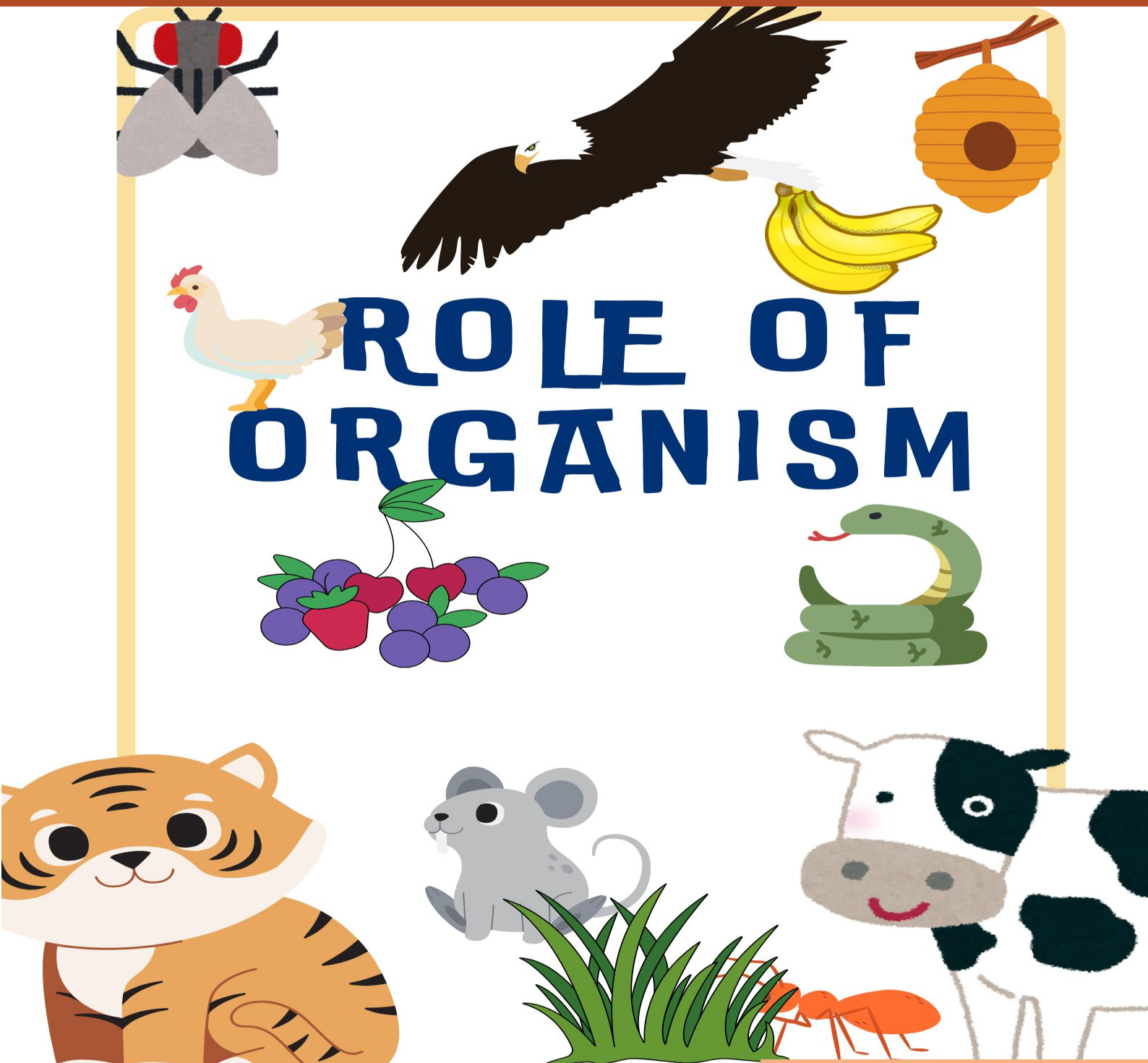


# TROPHIC LEVEL - ROLE OF ORGANISM



Learning Competency/ies:  
describe the transfer of energy  
through the trophic levels

S8LT-IVi 22



# LESSON 5: TRANSFER OF ENERGY IN THE TROPHIC LEVEL

## INTRODUCTION

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Energy flow in the ecosystem is a **one-way process**. It flows from the sun to the producers and consumers, as shown in the **food chain** and **food web**. An ecosystem needs energy because its living components also need energy. This is the most important factor that determines how many and what kind of organisms live in an ecosystem. In terms of nutrition, the organisms in an ecosystem can be classified into:

### A. Autotrophs or producers

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Are organisms that can manufacture their food during photosynthesis. It can occupy the first trophic level in the food chain and food web. Produce all the food for heterotrophs. Without autotrophs there will be no life on earth. **Ex. Plants, algae**

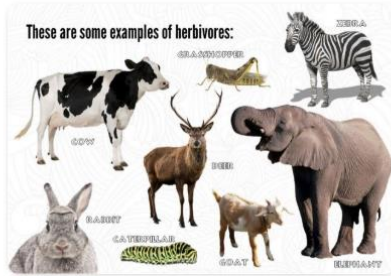
### B. Heterotrophs or consumers

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Organisms that derive their energy from consuming other organisms. They occupy the succeeding levels, ending with the top or highest-level consumers. There are several types of consumers:

## 1. Herbivores (Plant Eaters)



Herbivores are organisms that consume plants to obtain energy. They are primary consumers in the food chain.

## 2. Carnivores (Meat Eaters)

Carnivores are organisms that consume other animals for energy. They are secondary or tertiary consumers in the food chain.



## 3. Omnivores (Plant & Meat Eaters)



Omnivores are organisms that consume both plants and animals for energy. They are versatile feeders in the food chain.

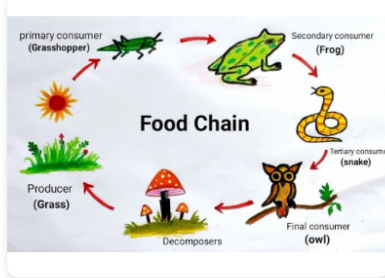
## 4. Decomposers (Nutrient Recyclers)

Decomposers break down dead organisms and organic matter, recycling nutrients back into the ecosystem. Examples include fungi, bacteria, and some insects.



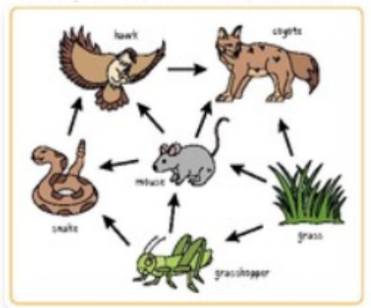
Ecologists assign each organism to a trophic level to follow the energy flow through an ecosystem. All members of this trophic level are the same. All members are of the same number of energy-transferring steps away from the sun.

## Food Chain



A Food Chain is a chain sequence of organisms used as food and the organisms that feed on them. It is an arrangement of organisms according to the order of predation in which one uses another source of food. The rule of 10% of the total amount of energy in a food chain goes to the next level since 90% of it is used by the organism itself.

## Food Web



The Food Web shows a complex feeding interrelationship between organisms in an area. It consists of interconnected food chains. It started with a producer who was followed by a series of consumers.

## Food Pyramid

The sun is the source of energy that plants convert into biomass. As the trophic level in the food pyramid increases, biomass decreases. In the food pyramid, the producers such as the plants start at the first trophic level at the bottom, plant-eaters at the second trophic level, and animal eaters at the third trophic level or succeeding level. The pyramid usually ends with the apex consumer.

## Biomass



The transfer of matter is 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. For example: bones, wood, shells, and some fruits and seeds. **Only 10% of energy is transferred to the next level. A biomass pyramid and an energy pyramid demonstrate the relationship between producers and consumers.**



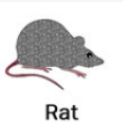










## II. PERFORMANCE TASK



### WORKSHEET No. 1: Understanding Food Chain

Direction: Group the organisms according to their classification in the feeding process. Complete the table below by indicating the name of the organisms. Write your answer in the box.

 Grass	 Owl	 Rat	 Carrots
 Rabbit	 Grasshopper	 Frog	 Fox
 Eagle	 Corn	 Python	

Producers	Primary consumers (herbivores)	Secondary consumers (carnivores)	Tertiary consumers (omnivores)

## WORKSHEET No. 2: Construct A Food Chain

**Directions:** Using the organism example above as a model, construct at least two food chains and put them in the box below. **Put an arrow for each sequence of organisms.**

<b>Carrots</b>	<b>Rabbit</b>	<b>Fox</b>	<b>Lion</b>
<b>Grass</b>	<b>Grasshopper</b>	<b>Rat</b>	

## Worksheet No. 3: Who Am I?

**Direction:** Match column A with column B. Write your answer in column C with the corresponding number and letter from columns A and B respectively. Example: 1-A

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

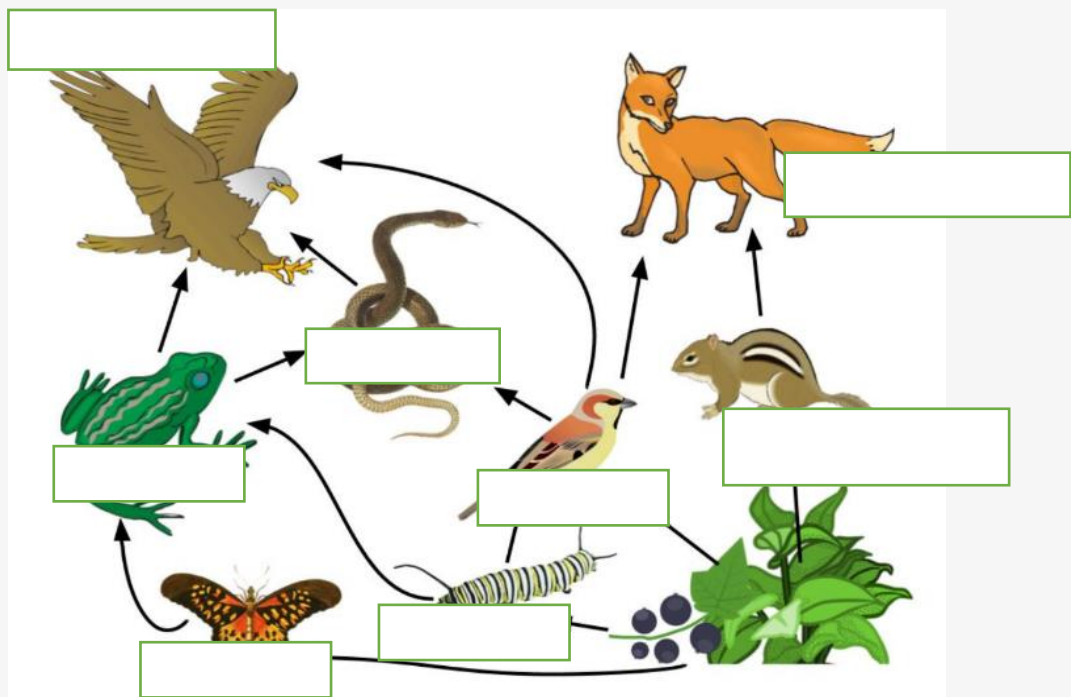
Worksheet No. 4: KNOW ME!

**Direction:** 1. Label each organism in a food web. (some have more than one label).

Legend: P=Producer      1=Primary consumer      2= Secondary Consumer      3=Tertiary Consumer

2. Now label each organism as: H-herbivores      C- carnivores      O-omnivores

Example: 1=H



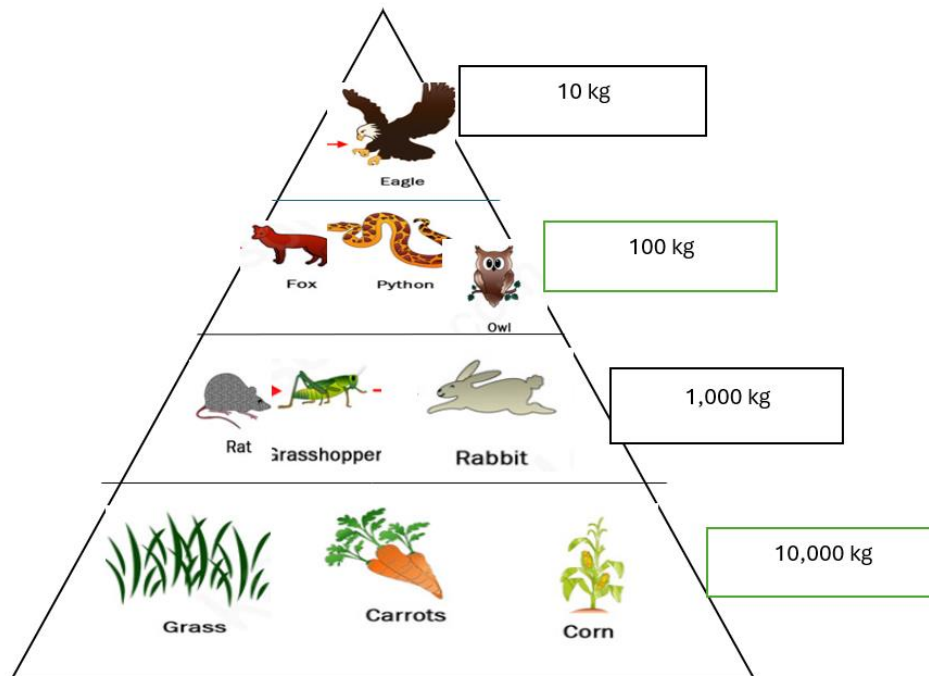
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B. Answer the question below about Food Web:

1. Name the organisms in the food web that are producer. \_\_\_\_\_
2. Name the organisms in the food web that are consumers. (at least 5)  
\_\_\_\_\_
3. Which organisms does the hawk eat? \_\_\_\_\_
4. From the food web, can you enumerate the food chain found? (at least 3)  
\_\_\_\_\_
5. Can energy and nutrients be recycled? Yes or No?

### Worksheet No. 5: FOOD PYRAMID

**Direction:** Identify the trophic level of the given organisms. Write your answer on the box.



Trophic Level	Organisms

B. Answer the question below:

1. If the rat consumes 100 grams of vegetables, how much biomass is transferred to it?

\_\_\_\_\_

2. 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 have feed on the tree. In which trophic level can you place the eagle?

\_\_\_\_\_

3. If human consumes 3,000kcal of fruits and vegetables, how much energy is transferred to him?

C. Refer to the illustration above:

1. Which organism has the:

a. greatest biomass: \_\_\_\_\_

b. greatest energy: \_\_\_\_\_

c. least biomass received; \_\_\_\_\_

d. % of energy gained by the owl: \_\_\_\_\_

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

\_\_\_\_\_

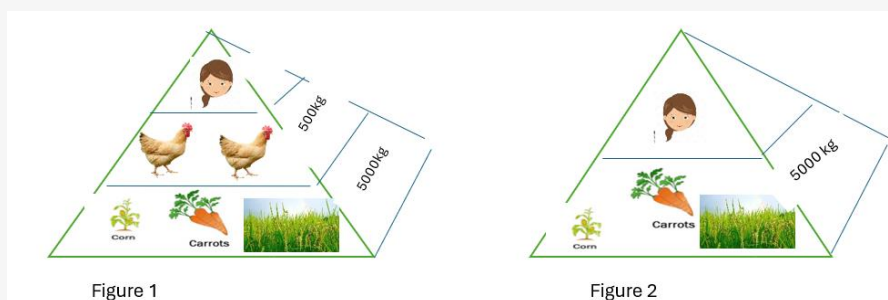
3. Why are the producers place at the base of the pyramid?

\_\_\_\_\_



### Worksheet No. 6 MEAT EATERS' VS PLANT EATERS

**Directions:** Use the illustration below to answer the following questions. Write your answer in the space provided.



1. How much biomass can a human get from a 500-kg chicken in Figure 1? \_\_\_\_\_  
b. how much biomass can get a human from 5000kg of rice and vegetables in figure 2? \_\_\_\_\_
2. Which has the greatest energy? Which has the greatest biomass? \_\_\_\_\_
3. If human consumes 3,000kcal of fruits and vegetables, how much energy is transferred to him? \_\_\_\_\_
4. What happens to the amount of energy and amount of biomass from bottom to top of the pyramid.

### B. Activity 7. 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 in maintaining the balance in the ecosystem?

### III. WRITTEN WORKS: (ASSESSMENT)



**Direction:** Read and understand each question, then choose the correct answer. Write the letter of your choice on a separate sheet of paper.

- ☐ 1. 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.
- ☐ 2. The food chain is characterized as a simple illustration of who eats and follows
- A. One path
  - B. Two paths
  - C. Three paths
  - D. Four paths
- ☐ 3. Which of the following organisms will a first-order consumer eat?
- A. Giraffes
  - B. Grasses
  - C. Goats
  - D. Grasshopper
- ☐ 4. Which consumer in a trophic level can eat both plants and animals?
- A. Carnivores
  - B. Decomposers
  - C. Herbivores
  - D. Omnivores
- ☐ 5. 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
- ☐ 6. If 600 kg of biomass is 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
- ☐ 7. 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
- ☐ 8. Which of the following organisms are placed at the base of the energy pyramid?
- A. Carnivores
  - B. Decomposers
  - C. Omnivores
  - D. Producers
- ☐ 9. Which consumer helps with the recycling of nutrients?
- A. Carnivore
  - B. Decomposer
  - C. Herbivore
  - D. Omnivore
- ☐ 10. Which of the following explains why fruits and vegetables eaters are energy efficient?
- A. They do not use 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.

References:

LSM Quarter 4-Deped Camarines Norte

ADM Science Quarter 4 – Module 8 Organisms’ Interaction

[list-of-carnivorous-animals-with-pictures-1024x576.png \(1024×576\)](#)

[Omnivores-1-1024x536.jpg \(1024×536\)](#)

[decomposers-worm-insects-fungi-bacteria.jpg \(1772×1171\)](#)

[rice-field-8.jpg \(1920×1080\)](#)

[1000\\_F\\_123287835\\_ESWNRmsqpeTCsJZ7zmgJc5Wm2UwxXDoc.jpg \(1000×1000\)](#)

[food-chain-2-1024x631.jpg \(1024×631\)](#)

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