

GRADE LEVEL: Grade 7
AGE LEVEL: 12-13 Years Old
SUBJECT: Science 7 Integration in Organic Agriculture
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LEARNING COMPETENCY: Describe the different ecological effect of changes in one population on other populations in the ecosystem.

TIME FRAME: 1 days

LEARNING OBJECTIVES:

Subject Matter Objectives:

1. identify the predators and prey animals in the environment,
2. describe how the predators capture the prey animals for food, and
3. describe how other animals interact with each other in the environment.

Organic Agriculture Objective:

Observe the organism's interaction with other organisms in a given agricultural area.

SUBJECT MATTER:

Topic:	Grade 7 Science:	Predator and Prey
	Organic Agriculture:	Concepts of Agro-Eco System

MAIN CONCEPTS AND SKILLS:

The environment is a collection of living and nonliving things. Mosses growing on rocks, garden snails gliding on garden fences, and fish swimming in water are just a few examples of how living and nonliving things interact. The living components of the environment are also called organisms. The nonliving components make up the physical environment of these organisms.

Organisms that belong to the same species and live in the same place form a population. The moss that grows on rocks makes up a population. Populations that live in the same place and interact with each other form a community; goats grazing on grass, chickens feeding on grains, and lizards preying on insects make up a community.

Interactions between organisms and their environment are also a familiar sight: carabaos helping farmers till the soil, earthworms burrowing in the ground, and birds using twigs to build their nests. Organisms interact with each other and their environment to meet their basic needs and survive. Some interactions are beneficial; others are harmful. There are also interactions in which populations of organisms are neither benefitted nor harmed. All these interactions take place in ecosystems.

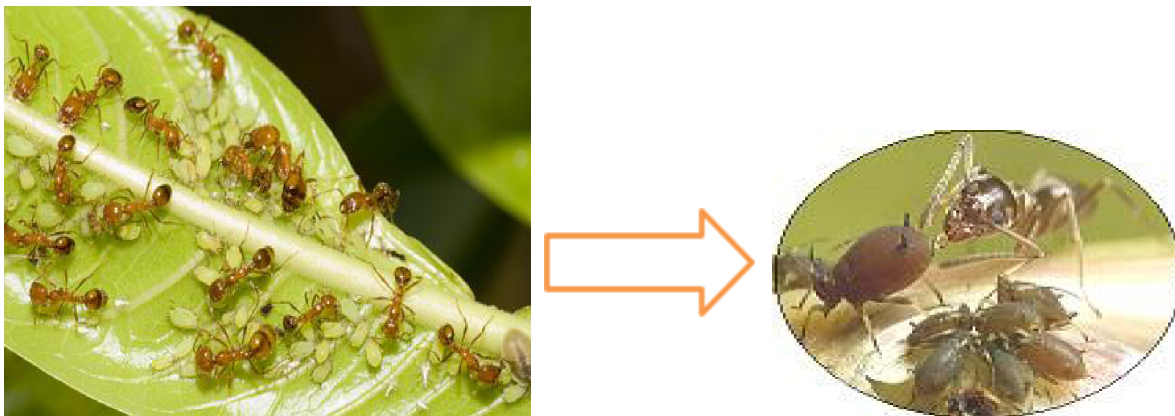
Ecological Relationships In the environment, there are plants, animals, and microscopic organisms such as bacteria and fungi. A group of organisms of the same kind living in the same place at the same time is called a population.



Photo: Courtesy of Rodolfo S. Treyes

Figure. An example of an ecosystem with different organisms

Populations that interact in a given environment form a community. In a community interactions within and among populations may have important influences to death rate and birth rates of the organisms and, in turn, on population growth and size -- these interactions may have positive, neutral, or even negative influences on interacting populations. Look at figure 5 below. What kind of interaction do the ants and aphids exhibit?



Source: <http://www.suchitraimages.com/photography/page/3>

<http://www.veggiegardener.com/pests/aphids/>

Figure A. Interacting populations of ants and aphids. B. An ant taking honeydew from the back of an aphid.

Aphids are small insects that suck liquid containing sugar from the conducting tissues of plants. These aphids get a certain amount of sugar and other nutrients from this liquid. However, much of the liquid called honeydew is released through the aphids' anus. The ants consume this honeydew as food. The ants, in turn, protect the aphids from their insect predators. Thus, both species benefit from each other. This interaction between the populations of ants and aphids is referred to as mutualism.

Some interactions among organisms are easier to determine than others, and some effects can easily be observed. Study the photographs that follow.

Figure shows fern plants growing on a trunk of a *Narra* tree. What kind of relationship do you think do these two organisms have?



Photo: Courtesy of Rodolfo S. Treyes

Epiphytes are plants that depend on other plants for support. Usually, epiphytes grow on trunks and branches of trees. Figure 6 shows an epiphytic fern that attached itself on a trunk of a *Narra* tree without harming the tree. The *Narra* tree is a host that provides a place for the fern

to live. When it rains, the ferns get nutrients from rotting leaves and other organic materials that collect at the root base of the fern plant. This relationship is called commensalism -- one organism benefits from the host organism, while the host organism is neither positively nor negatively affected. What other examples of commensalism can you give?

Next figure shows an insect larva and a leaf of a plant. *What kind of relationship do you think do these two organisms have?*

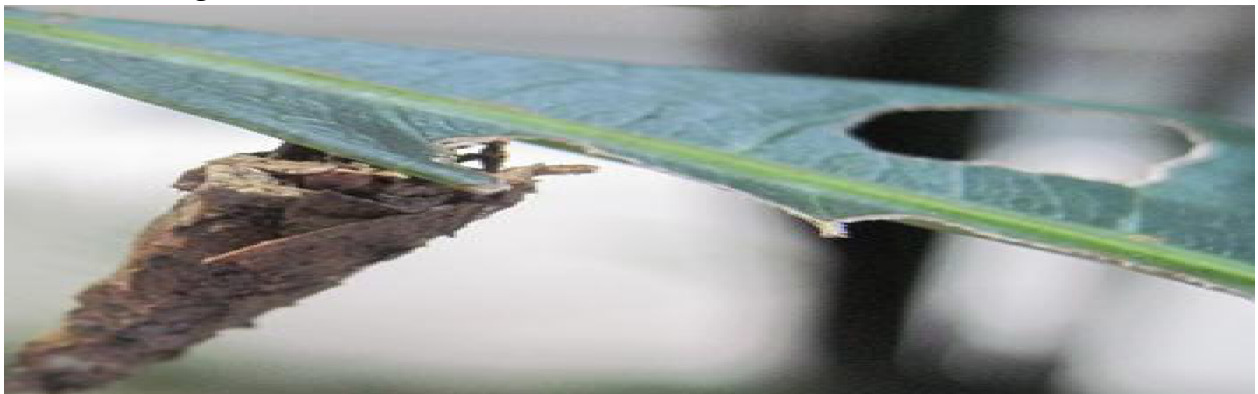


Figure A larva of an insect lives on the leaves of the plant and causes damage by eating the leaves.

The insect larva (the parasite) gets its nutrients by eating the leaves – thereby, damaging the plant (the host). This relationship is called parasitism. A parasite gets its nutrients from a living host harmed by the interaction. Another example of parasitism is the flea that thrives on a dog. The dog is harmed by the flea that feeds on its blood. What other examples of parasitism can you give?

Your environment is home to many kinds of living and nonliving things. You also see interaction between them like in the rocks and fences that are inhabited by small plants and algae. These rocks that are usually found in wet places provide anchorage and nutrients to the small plants and algae.

Animals kill and eat other animals. This interaction is called predation. An animal that kills and eat other animals is called a predator. An animal that is killed and eaten by its predator is called a prey. Prey animals are usually smaller and less powerful than the predator that eats them.

In a given community, predators compete with other predators for prey animals. In the wild, a predator's prey may be another prey's predator. This means that while an animal hunts and feeds upon another animal, it can also become prey to a larger and stronger predator.

When two populations use the same resource, they participate in a biological interaction called competition. Resources for which different populations compete include food, nesting sites, habitat, light, nutrients, and water. Usually, competition occurs for resources in short supply.

MATERIALS NEEDED:

- Worksheet
- pencil
- Magnifying lens
- Pictures of animals

LEARNING ACTIVITIES

Prerequisite:

- Ecological Relationships

Review/ Motivation

Video clip/ pictures of animals in the forest or farm

Student Activity:

- What eats what? (appendex1)

Analysis

- What organisms are involved in the pictures?
- What do you call to the animal eats the other animal? The animal eaten by animal?
- How the predators capture the prey animals for food?
- Which part of the body does the eater use to get its food?

Abstraction

- How predators and prey animals interact with each other in the environment and other components in the environment?

Application

Predators compete with other predators for prey animals. In the wild, a predator's prey may be another prey's predator. This means that while an animal hunts and feeds upon another animal, it can also become prey to a larger and stronger predator.

ASSESSMENT

- What do you think of the interaction that animals kill and eat other animals?
- What is the relationship between the carabao and bird in the garden?
- What happens to an orchid in the garden if its host is dying?

AGREEMENT

Visit an area in your community, make an observation and record your data. Assess the area and make relevant suggestions that would help to improve the community.

Reading Materials/Links/Websites

About Our Earth, Panda. (2008). Ecological Interactions. Teacher Resources, Web Fieldtrips. Retrieved February 7, 2012 from <http://wwf.panda.org/>

Global Change, University of Michigan. (2008). Ecological Communities: Networks of Interacting Species. Global Change Lectures. Retrieved January 16, 2012 from <http://www.globalchange.umich.edu/>
Johnson, George B. and Raven, Peter H. Biology. Holt, Rinehart and Winston: A Harcourt Education Company, U.S.A. 2004

Nature, International Weekly Journal of Science. (2010). Ecological Interactions. Nature Journal. Retrieved January 16, 2012 from <http://www.nature.com/nature/index.html>
Reece, Jane B. et al. Campbell Biology: Concepts and Connections, 7th ed. Pearson Education Inc., U.S.A. 2012

Activity **Which eats what?**

Objectives

In this activity, you should be able to:

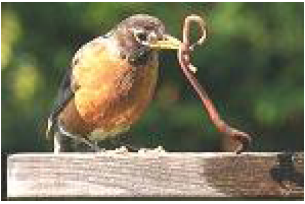
1. identify the predators and prey animals in the environment,
2. describe how the predators capture the prey animals for food, and
3. describe how predators and prey animals interact with each other in the environment.

Materials Needed

worksheet
pencil
hand lens

Procedure

1. Observe each organism in the picture carefully. Fill in the appropriate box to each of the organism.

Organism	What organisms are involved?	Which is the eater? Which is eaten?	Which part of the body does the eater use to get its food?
			
			
			
			
			

2. You may visit a school ground or garden to make more observations.

3. If you have observed other organisms that are not in the list, you may also add such observations to your worksheet. No need to put pictures; just write the common name of the organisms on the appropriate box.

Organism	Which organisms are involved?	Which is the eater? Which is eaten?	How does the eater get its food?
