

Name:

Date:

Interactions in Ecosystems

Instructions: Read the article to answer the questions below.

An ecosystem is made up of all the living and non-living things that interact with one another in the same environment or area. Whenever two organisms interact, the effect of the interaction on the individual organisms can be positive, negative, or neutral. Interactions between living things in an ecosystem vary and can be classified, or categorized.

Competition

Competition is the struggle between two or more individuals or species for a common resource. It occurs in all ecosystems, and it is one of the most common interactions for all living things. Competition between members of different species is called interspecific competition. Hyenas and vultures both eat carcasses, or bodies of dead animals, and they often compete for this food resource. Competition can also be intraspecific, or between individuals of the same species. For example, birds of the same species compete for safe nesting sites. The individuals that are successful have a better chance of reproducing.

Predator-Prey

In a predatory, or predator-prey, interaction, members of one population get the food they require by killing and eating members of another population. Predation is the capturing, killing, and consuming of one living organism by another. A shark is an example of a predator, an organism that gets the food it needs by killing and eating another organism. Examples of predators include lions, frogs, and spiders. The organism that is consumed is called prey.

A predatory interaction has a positive direct effect on the predator organism and a negative direct effect on the prey organism. However, predation can have a positive impact on the prey species as a whole. That's because prey organisms that are less able to evade predators are removed from the population, while prey organisms that are better able to evade predators survive.

Symbiosis

Close living arrangements between two different species is called symbiosis. The word comes from the Greek word meaning "state of living together." Usually the two organisms are in close physical contact, with one living on or in the other. Symbiosis is classified as mutualism, commensalism, or parasitism. These relationships range from mutually beneficial to harmful, or even fatal, for one of the species.



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Predator and Prey

The Caribbean reef shark is feeding on a red lionfish.

Mutualism: An interaction between two species that benefits both is known as mutualism. One example of mutualism is pollination, which is necessary to grow many of the foods we eat and is an important part of plant reproduction. An animal—usually a bird or insect—benefits by feeding on the nectar or the pollen of a flower. As the animal feeds, some of the flower's pollen sticks to its body. The animal then transfers this pollen to the next flower it visits. The flower benefits from this interaction because its pollen is transferred directly to another flower.

Commensalism: A relationship in which one member benefits while the other is neither helped nor harmed is known as commensalism. For example, the remora fish can attach itself to a shark, whale, or large turtle and be carried from meal to meal, feeding on scraps scattered by its host. The remora neither harms nor helps the host.

Parasitism: In parasitism, one member of the relationship benefits while the other is harmed. Nearly all species of plants and animals are subject to parasitism by at least one—and usually several—species of parasite. Parasites generally absorb food from their hosts but may also receive water, minerals, and shelter.

Scientists apply their understanding of interactions that occur in ecosystems in many ways. For example, detailed information about the predator-prey relationships in an ecosystem can help scientists predict wide-ranging food web disruptions that could result from a change in a single population. Human impacts, such as deforestation, also can be analyzed using information about interactions in the affected ecosystem. Scientists can apply their understanding of interactions to help protect ecosystems and minimize the effects of human activities.

1. What is the central idea of the article?
 - a. All ecosystems have living and non-living parts that interact.
 - b. Parasitism, mutualism, and commensalism are three types of symbiosis.
 - c. Living things interact in many ways, and those interactions can be categorized.
 - d. Competition is the struggle between individuals or species for a common resource.
2. What claim is best supported by the following sentence from the article?
A remora fish can attach itself to a shark, whale, or large turtle and be carried from meal to meal, feeding on scraps scattered by its host.
 - a. Mutualism is one type of symbiosis.
 - b. Interactions can have positive effects on individual organisms.
 - c. Competition occurs when organisms need a common resource.
 - d. A predatory interaction has a positive direct effect on the predator organism.
3. Analyze the structure of the article. How do the headings help you understand the information?
 - a. They provide a summary of how organisms interact.
 - b. They identify the central idea and details about interactions.
 - c. They identify the categories of interactions and their hierarchy.
 - d. They show the sequence, or order, of the interactions between organisms.

4. What is the meaning of the word *common* as it is used in the following sentence from the article? Competition is the struggle between two or more individuals or species for a *common* resource.
- shared
 - familiar
 - frequent
 - ordinary
5. Based on information in the article, how would an interaction between two organisms that benefits both organisms be classified?
- predation
 - parasitism
 - mutualism
 - competition
6. What details would you need to know about the competing organisms to categorize a competitive interaction as either *interspecific* or *intraspecific*?
- Whether they are plants or animals
 - Whether they are competing for food or shelter
 - Whether they benefit or are harmed by the interaction
 - Whether they are of the same species or different species
7. What is the relationship between the terms *commensalism* and *symbiosis*?
- Symbiosis is an example of commensalism.
 - Commensalism is a specific type of symbiosis.
 - Commensalism is a less specific category than symbiosis.
 - Symbiosis and commensalism are two types of mutualism.

Interactions in Ecosystems Answer Key

1. **c.** *Living things interact in many ways, and those interactions can be categorized.*
2. **b.** *Interactions can have positive effects on individual organisms.*
3. **c.** *They identify the categories of interactions and their hierarchy.*
4. **a.** *shared*
5. **c.** *mutualism*
6. **d.** *Whether they are of the same species or different species*
7. **b.** *Commensalism is a specific type of symbiosis.*