

# Competition in Ecosystems

## Reflect

Do you have a brother or sister? Do you both try to get attention from your parents or grandparents? If so, you **compete** for attention. In this instance, both of you are working against each other to try to get what you want. Look at the image on the right of a brother and sister trying to catch the most river frogs. One will end up a winner, while the other will end up losing the competition.



**competition** – organisms fighting to get the same resource



### How does competition occur in nature?

In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, which consequently limits their growth and reproduction. In nature, there are many instances of competition. Sometimes competition occurs between members of the same species. This often happens when animals try

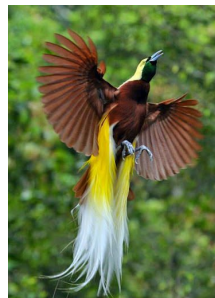
to find a mate. For example, when red deer begin mating season, the males will fight each other by locking their antlers and trying to flip each other. This is called rutting. The strongest deer emerges as the winner, and he is more likely to be found desirable as a mate by the female deer. He may be known as the alpha (leader) male because he has established his dominance within the herd. The female deer will mate with the alpha male, because he has proven himself to be the best and strongest animal.

## Look Out!

Many organisms compete for mates by showing off to attract attention. Examples include a show of physical prowess, a dancing display of feathers, and making patterns in the sand:



Bighorn sheep run toward each other and butt heads to fight off the weaker competition.



Male birds of paradise dance to get a female's attention.



Pufferfish create elaborate circular patterns in the sand to attract a female mate.

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## What Do You Think?

Do you think animal species compete for resources? For example, both sharks and dolphins eat fish. Both need food to survive. If one eats enough fish to survive but there is not enough fish for the other, the one that does not get its necessary food may die. Both sharks and dolphins may have to swim long distances to find food. Sharks can hunt food in deeper ocean areas or along seashores where vulnerable sea mammals live. Other sea organisms may eat the fish as well, making competition even fiercer.

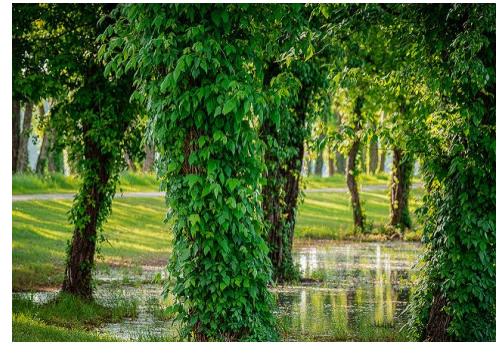


Sharks (left) compete with dolphins (right) for fish.



Because of limited space, limited food, or other limited resources, one population of an organism may compete with another population for the same things. For example, one group of chimpanzees may attack another nearby group to gain control of certain fig trees that provide food.

Plants also compete for resources. Vines climb tree trunks so they can be exposed to the sun. They need sunlight to go through photosynthesis—that way, they can make their own food. If you have trees in your neighborhood, see whether any of them have vines growing on them. Make a sketch of how the vine is connected to the tree. Does the vine seem to be growing in the direction of the sunlight?



### How do you think organisms work together?

Some organisms are better able to survive because they have paired up with another organism and they help each other to survive. The pistol shrimp and the goby have such a mutually beneficial relationship, called *mutualism*. Pistol shrimp dig large burrows for homes that also serve as a home for the small goby fish. In return, the goby acts as a lookout for the pistol shrimp, which has poor eyesight, alerting the shrimp when danger is near by wiggling its tail. When the shrimp feels the wiggle, it knows to hide in the burrow. The goby also gets scraps of food from the pistol

shrimp. The two organisms help each other, with each getting something good out of the relationship.

# Competition in Ecosystems

## Career Corner: Animal Behaviorist

Animal behaviorists are people who study how animals relate to their environments and to other animals. They learn about what causes certain animal behaviors and reactions, and they may also study how animals react to predators, compete for resources, find mates, and respond to changes in the environment.



Many zoos and museums employ animal behaviorists to work with the animals they have on-site. Some behaviorists also research newly discovered organisms and work closely with the medical field. If you are interested in seeing how animals work together, compete, and respond to other animals, a career as an animal behaviorist might be perfect for you!

## Reflect

### Resource availability affects growth, competition, and rate of reproduction.

How resources become available in an ecosystem directly affects several factors within and among populations of organisms.

- **Population changes:** Changes in the amount and availability of a given resource (ex: less food) may result in changes or limits in the population growth of an organism (ex: less food results in fewer organisms).
- **Individual organism changes:** Changes in the amount or availability of a resource (ex: more food) may result in changes in the growth of individual organisms (ex: more food results in faster growth).
- **Competition:** Resource availability drives competition among organisms, both within a population and between populations.
- **Rate of reproduction:** Resource availability also affects a population's rate of reproduction.

Competition for Resources

Fighting Over Territory

Fighting Over Food

The complex block contains a title 'Competition for Resources' at the top. Below the title are two images. The first image shows a group of swans in a pond; one swan is in the air, flapping its wings, while others are in the water. The second image shows two sharks in the water, with one shark's mouth open, showing its teeth, as if it is attacking or competing with another shark. To the right of each image is a caption: 'Fighting Over Territory' for the swans and 'Fighting Over Food' for the sharks.

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## Try Now

In times of surplus, colonies of organisms living together can cooperate with each other. In times of shortage, those same colonies may have to compete against each other. Read the descriptions of environmental changes in the chart below. Then read the events that happened as a result of the changes. Match each event with the most likely environmental change. Write your answers on the right side of the chart.

### Environmental Changes

| Environmental Change  | Resulting Event |
|---|-----------------|
| Seasons of heavy rains flood an area and create new ponds.            |                 |
| A hurricane brings salt water from the ocean into rivers and streams. |                 |
| Humans cut down many trees in a forest.                               |                 |
| A fire moves through a grassland ecosystem.                           |                 |

### Events

- Algae begin to grow rapidly at the surface of the water.
- The larger fish begin to fight among themselves for smaller prey.
- Prairie dog burrows are inhabited by other savanna mammals.
- Ferns and grasses reach outward into the open sunshine.