Know Your Limits

What environmental factors influence population size?

A tropical rain forest can support large populations of trees. A desert, however, will probably support few or no trees. Each environment has different amounts of the resources that living things need, such as food, water, and space.

Resource Availability

The amount of resources in an area influences the size of a population. If important resources are lost from the environment, a population may shrink. The population may grow if the amount of resources in the environment is increased. But if the population continues to grow, the individuals would eventually run out of resources. The carrying capacity is the maximum number of individuals of one species that the environment can support. For example, the carrying capacity, or the number of owls that a forest can support, depends on how many mice are available to est and how many trees are available for the owls to live in.

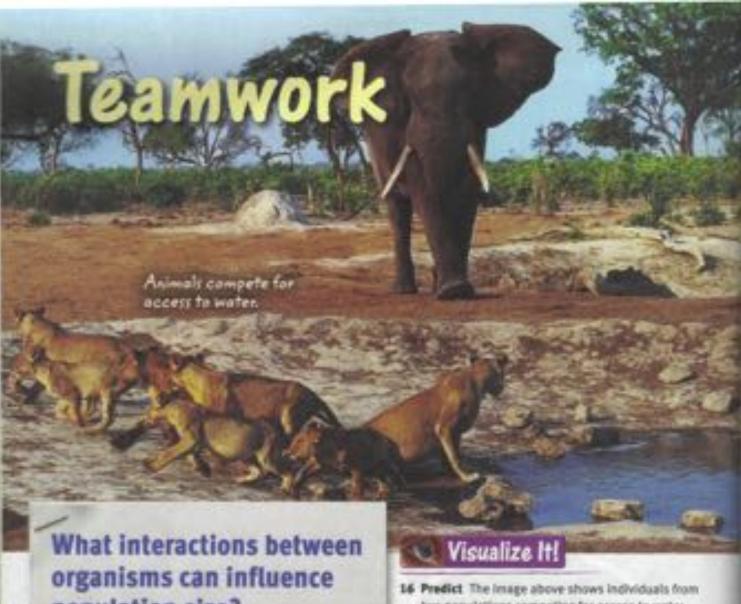
Deforestation causes a sudden change in resource availability.

Visualize It!

8 Identify Make a list of each population in the image that would be affected by drought.

Animals use plants as food and shelter. Plants depend an swalight and mater as resources.

Changes in the Environment The carrying capacity can change when the environment changes. For example, after a rainy season, plants may produce a large crop of leaves and seeds. This large amount of food may allow an herbivore population to grow. But what if important resources are destroyed? A population crash occurs when the carrying capacity of the environment suddenly drops. Natural disasters, such as forest fires, and harsh weather, such as droughts, can cause population crashes. The carrying capacity can also be reduced when new competitors enter an area and outcompete existing. populations for resources. This would cause existing populations to become smaller or crash. Attive Reading 9 Describe What are two ways in which the environment can influence population size? Drought slowly reduces the amount of water ovailable as a resource to different populations Think Outside the Book 10 Apply With a classmate, discuss how the immigration of new herbivores might affect the carrying capacity of the local zebra population.



population size?

As living things try to gather the resources they need, they often interact with each other. Sometimes interactions help one individual and harm another. At other times, all of the organisms benefit by working together.

Competition

When two or more individuals or populations try to use the same limited resource, such as food, water, shelter, space, or sunlight, it is called competition. Competition can happen among individuals within a population. The elk in a forest compete with each other for the same food plants. This competition increases in winter when many plants die. Competition also happens among populations. For example, different species of trees in a forest compete with each other for sunlight and space.

two populations competing for access to water.

What would happen to the size of the lion population if elephants usually won this competition?

What would happen to each population if lions usually won this competition?



Let the Games Begin!

Effect

Why does competition occur in communities?

In a team game, two groups compete against each other with the same goal in mind—to win the game. In a biological community, organisms compete for resources. Competition occurs when organisms fight for the same limited resource. Organisms compete for resources such as food, water, sunlight, shelter, and mates. If an organism doesn't get all the resources it needs, it could die.

Sometimes competition happens among individuals of the same species. For example, different groups of lions compete with each other for living space. Males within these groups also compete with each other for mates.

Competition can also happen among individuals of different species. Lions mainly eat large animals, such as zebras. They compete for zebras with leopards and cheetahs. When zebras are scarce, competition increases among animals that eat zebras. As a result, lions may steal food or compete with other predators for smaller animals.

15 Predict in the table below, fill in the missing cause and effect of two examples of competition in a community.

Course

A population of lions grows too large to share

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Several male hyenas compete to mate with the females present in their area.

Active Reading

14 Identify Underline each example of competition.

Think Outside the Book

16 Apply With a classmate, discuss how competition might affect the organisms in this photo.

> Many organisms rely on the same water source.