



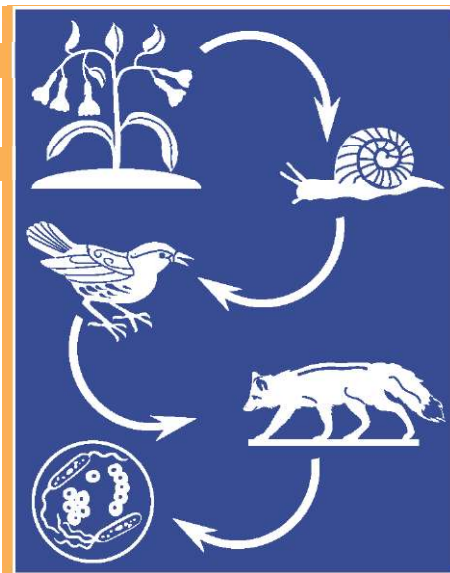
## Eat or Be Eaten

You're not alone in this world. Nothing is. That's because every living thing depends on something else for its survival. Every plant and animal on Earth is part of a specific food chain. A food chain is just what it sounds like: a chain of feeding. Most chains are five or six links long.

**PLANT:** The first link is a primary producer, a plant, or other photosynthetic organism. Plants capture energy from the sun and produce their own food—and food for the next link.

**SNAIL:** The second link of a food chain is a primary consumer because it's the organism that eats the producer.

**BIRD:** Link number three belongs to secondary consumers. They eat the primary consumers.



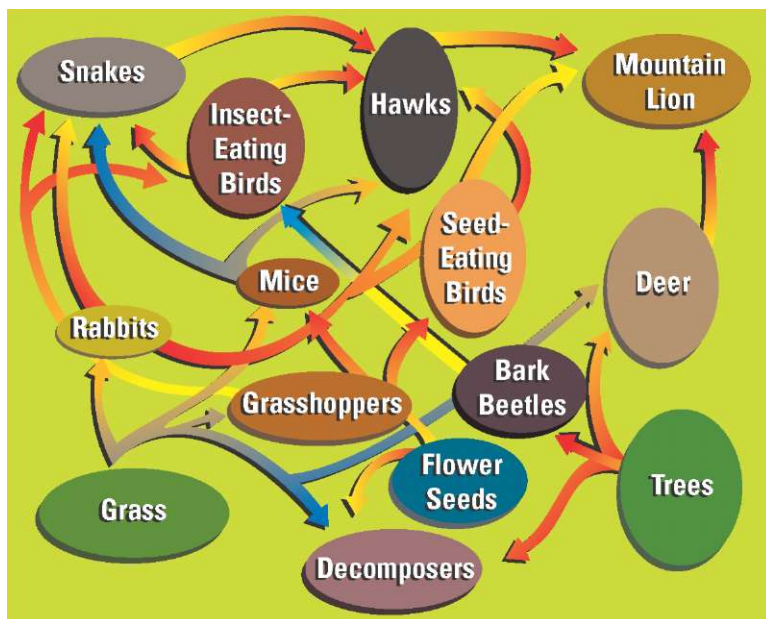
**FOX:** The next link may be where top predators are. They usually feed on other carnivores in the ecosystem.

**BACTERIA:** When top predators die, they're decomposed by bacteria, fungi, and insects. They feed off the fox and break down its nutrients, returning them into the soil or atmosphere.

## Web of Life

Ecosystems can't be described by a single food chain because most organisms are part of more than one. That's why scientists use food webs to understand the connections among all the organisms in an environment. Food webs are really just a bunch of interlinked food chains. For example, humans eat beef. Cows eat grass. Wolves eat cows. So humans are part of a food web with wolves, although wolves are not part of our food chain. We're connected with wolves through overlapping food chains. In essence, every organism in the world is part of one giant food web.

Think about all of the products you eat. How many different food webs are you part of?



# Threatened Food Webs

As species become endangered or extinct, the food webs and ecosystems to which they belong take a hit, too. Take a look at these numbers and think about how they affect the earth's ecosystems.

- 100—Plant and animal species that become extinct every day
- 478—Animal species in the U.S. that are listed as threatened and endangered
- 703—Plant species in the U.S. that are listed as threatened and endangered
- 1000—Animal species worldwide that are considered endangered
- 1,500,000—Number of species on Earth that scientists have cataloged
- 20 x 1,500,000—Number of species thought to inhabit the planet

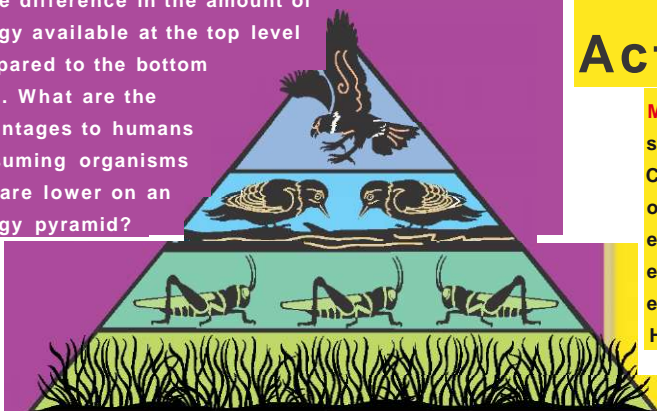


According to the U.S. Fish and Wildlife Service, these are the number of species that are endangered in every state and protectorate.

## Keep up the Energy

Energy in a food chain is constantly renewed by sunlight. Without sunlight, most ecosystems wouldn't make it. Sunlight provides energy to producers—like plants—to fuel photosynthesis. Energy flows from one organism to another in the form of food. For example, when a grasshopper eats grass, it's consuming the grass's energy. When a small bird eats a grasshopper, it is consuming energy from the grasshopper that ate the grass. When a hawk eats a bird . . . well, you get the idea. As you move further up the food chain, there is less available energy. Energy pyramids show how energy decreases at each feeding step of a food chain.

Only about 10 percent of the total energy from each level of the pyramid is transferred to the next level. Look at the difference in the amount of energy available at the top level compared to the bottom level. What are the advantages to humans consuming organisms that are lower on an energy pyramid?



## Where Does it Go?

Many materials that make up your body have been cycled through ecosystems. The carbon atoms in your body right now have been on Earth since the planet was formed billions of years ago. Water and nitrogen in your body have been recycled through ecosystems, too. The final stage in a food web belongs to the decomposers. Decomposers, such as fungi and bacteria, are responsible for breaking down organic matter and releasing oxygen, carbon, and nitrogen back into the environment. In every ecosystem—and on earth—energy is never lost nor gained. It's always recycled.

## Activity

**MAKE THE CONNECTION** Eliminating plant and animal species could have serious consequences worldwide. Choose one ecosystem to research. Find out what kinds of plants and animals live there. Make a poster of the ecosystem's food web. What would happen to the ecosystem if one or more plant or animal species were eliminated? Make another poster depicting that scenario. How would that affect other ecosystems?