



it all makes sense

Organisms live in ecosystems that provide them with the food, water, shelter, air and space they need to survive. Organisms change their behavior in response to internal and external cues in their environment. In this chapter, you will learn more about how organisms interact with and affect their environment and the other organisms in their environment. You will learn how these interactions help populations of organisms survive.

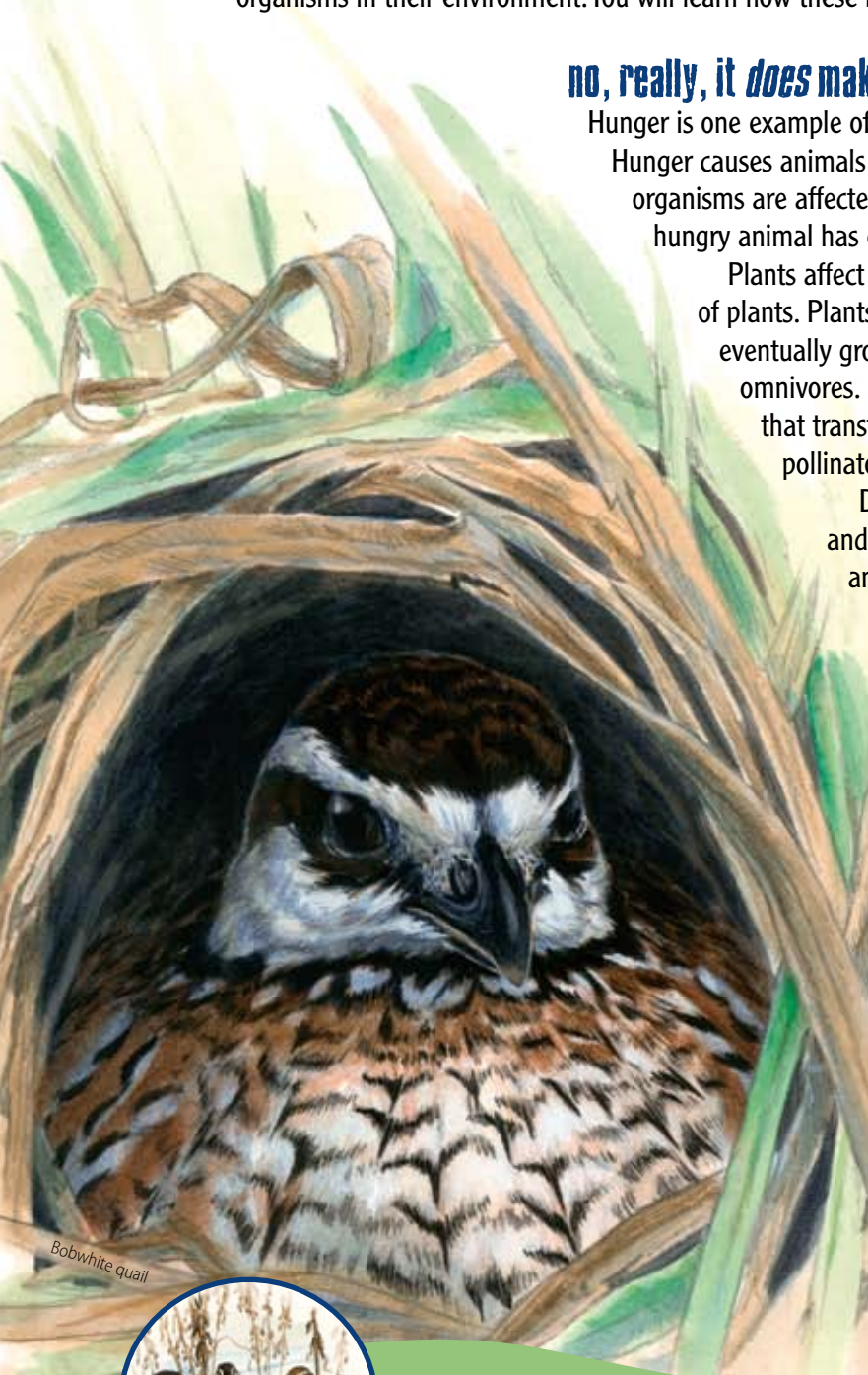
no, really, it *does* make sense

Hunger is one example of how an internal cue changes an animal's behavior. Hunger causes animals to forage for plants or hunt other animals. Other organisms are affected because they are the ones being eaten or because the hungry animal has eaten some of their food.

Plants affect the survival of animals, and animals affect the survival of plants. Plants must exchange pollen to develop fruits and seeds and eventually grow into new plants that will be food for herbivores and omnivores. Bees, butterflies and other insects are **pollinators**, animals that transfer pollen from one flower to another. Without these pollinators, many plants would not be able to reproduce.

Dragonflies lay their eggs along the stems of arrowhead and other emergent pond plants. Frogs lay a glob of eggs, and toads lay long strands of eggs directly in pond water. Once hatched, the young of dragonflies, frogs and toads find shelter and food among the plants.

Many plants depend on wind or animals to scatter or **disperse** their seeds. Some seeds have wing-like parts that allow them to spin down from the top of trees, and others with soft, fuzzy coverings are light enough to float away on the breeze. Seeds with sticky or prickly surfaces cling to animal fur and hitch a ride until they fall off or are scratched off. Where they land is where they can germinate and grow.



Bobwhite quail



Bobwhite quail sing their name: *bob WHITE, bob WHITE*. Groups of quail, called coveys, roost on the ground in a ring, birds facing outward, guarding against predators.

Quail live throughout the year in prairies that have both brushy areas and woodland edges. Bunches of prairie grasses make travel on the ground easier and safer. For quail, like all wildlife, survival is a year-round struggle with harsh winters and blazing hot summers, spring floods and summer drought.



Bumblebees buzzing about a prairie gather nectar from purple coneflowers. Each coneflower benefits from the visit because the bees leave behind bits of pollen they have collected in their **pollen baskets** from other purple coneflowers.



Some plants have seeds that will not germinate or grow unless they are eaten and passed through an animal's **digestive tract**. Migrating cedar waxwings gorge on berries in a grove of cedar trees. As the cedar waxwings continue their migration, the cedar seeds are digested and dropped from the birds. They distribute the digested seeds all along the migration route where many will grow.

Animals depend on plants as a source of food and energy, but they also use plants for shelter. Plants in ponds, forests and prairies offer places to hide from predators, places to rest and places to raise young or simply deposit eggs.

Animals living in forests and prairies find shelter and food among the roots, leaves and flowers of plants and trees. Fallen leaves from trees and plants blanket the forest floor and create a layer of safety and warmth for other plants and small animals. Thick clumps of prairie grass make perfect shelters and nesting spots for rodents, birds and snakes.

Prairie racerunners use flat rocks as shelter to hide from predators. Flat rocks are also important as places to warm up or cool down for prairie racerunners and other organisms.



When is a rock not just a rock?
When it's an umbrella, a heating pad, a hideout or a home.

Prairie racerunners are very fast lizards. The warmer they are, the faster they run. Speed is their greatest defense, but long stripes on the prairie racerunner help keep predators wondering which way the speedy lizard is racing.

Big brown bats remain in Missouri all year. Hollow trees, deep rock crevices, buildings and caves are some of the places they use to roost and hibernate.





Survival often depends on being camouflaged and blending into an environment. Newborn deer are excellent examples of camouflage. White spots on their soft, brown fur allow fawns to blend into the forest. They remain hidden while their mothers forage for food. Thirteen-lined ground squirrels, greater prairie-chickens, ornate box turtles and bullsnakes are a few of the prairie animals with stripes, spots and bands of light and dark colors that help them blend into the prairie environment.

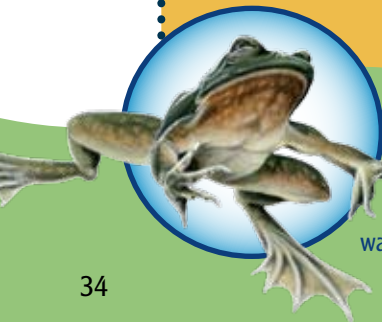
When animals try to protect themselves, they are responding to external cues and using **defense mechanisms** to interact with their environment. Venomous snakes and spiders use venom to protect themselves and to make their live food hold still. Skunks, daddy longlegs and certain snakes and insects have glands that give off such foul smells that other animals leave them alone. Specialized feet, tails and body shapes allow animals to run, jump and climb to escape other animals or to capture them.

Decomposers are essential to all animals and plants. Decomposers clean up scat and dead plant and animal material by breaking it down and returning it back into the soil as nutrients. Along with water, air and sunlight, these minerals and nutrients are used by plants to make their own food.

*How is a daddy longlegs like a skunk?
They both protect themselves by giving off bad odors.*

When a skunk sprays, it uses two tiny hose-like structures that are connected to glands at the base of its tail. A skunk can aim its spray behind, to either side, or in front of itself by changing the direction of the hose-like structures and by twisting its body.

The spray is a thick, oily, greenish yellow fluid that has a strong, unpleasant odor and glows in the dark.



When startled by sound or movement, frogs use their strong back legs to jump back into the water or hop away quickly.



Daddy longlegs eat dead and decaying plants on the forest floor. They use their legs to touch, hear and smell.



Female rabbits have 2–4 litters of up to 9 young, called kits or kittens, in a year.



Old, fallen logs and dead plant matter on a forest floor are alive with sowbugs, carpenter ants, termites, beetles, fungi and bacteria consuming the dead matter and releasing it back into the soil as valuable minerals and nutrients.

Deep, rich soil is created when root systems of prairie plants are decomposed by microorganisms, which are too small to be seen without a microscope. Decomposers are part of the food chain and pass nutrients back to the plants. They are an environment's greatest recyclers.

Balance is the key to healthy ecosystems. Ecosystems may become unbalanced when populations of plants or animals become too large or too small as a result of droughts, floods or diseases. Populations of plants are eaten by herbivores. Populations of herbivores are eaten by carnivores. Populations of carnivores are eaten by other carnivores or omnivores. Balanced populations depend on an environment having enough food for all the animals as well as the right number of animals to eat the food.

When population numbers change, the balance between predator and prey changes. If the bobcat population suddenly became smaller, there would be fewer predators to eat rabbits. In a short time, rabbit populations would increase and consume too many plants. With fewer plants, eventually rabbits and other plant consumers would not have the food they needed to survive.

summary

Organisms interact with other organisms and the environment by seed dispersal, pollination, camouflage and defense mechanisms. A decrease in prey populations can cause a decrease in predator populations. A decrease in predator populations can cause an increase in prey populations. Different organisms survive in a given environment because they have special structures or behaviors.

Humans are part of the picture, too.



Cottontail rabbit



When humans visit a prairie and dig up large numbers of wildflowers, they are removing essential pieces of prairie ecosystems. Rabbits, butterflies, birds and other herbivores that depend on those forbs for food and shelter may have more difficulty surviving. Bobcats, coyotes, hawks and other predators that depend on those herbivores for food are affected.

Fishing regulations help balance predator/prey populations. Taking fish smaller than the legal length limit reduces the number of fish old enough to reproduce.



Riding an ATV through forests can damage plants and homes of burrowing or ground-nesting animals.



Litter is ugly. It can also be a health hazard for humans and other animals.

