Teacher's Guide
Grade 5: Organisms and Their Environments

TEKS 5.9: Organisms and environments. The student knows that there are relationships, systems, and cycles with environments. The student is expected to:

A) observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving elements;

Background Information: This unit demonstrates and reinforces how living things interact in their ecosystem in order to meet their basic needs. Organisms need both living and nonliving elements of the ecosystem in order to survive. It emphasizes that organisms must compete for limited resources, such as food, water, and shelter, while the interdependence that exists between organisms is evident in the different food chains that form a food web within an ecosystem.

Students will identify the roles of producers and consumers within an ecosystem as they interact in order to get energy. They will also identify primary and secondary consumers within food chains and webs. They will learn about a unique group of consumers called decomposers that use the bodies of dead organisms for energy. As decomposers break down the bodies of dead organisms, they return nutrients to the soil that producers need in order to be healthy as they grow.

Prerequisite Knowledge: Prior to this year students have learned to distinguish between living and nonliving things. They can identify the basic needs of plants (water, sunlight, air, growing space) and animals (food, shelter, water, air). They have observed that living things have structures and behaviors, or adaptations, that allow them to survive in the particular environment in which they live.

They know that producers use the energy from the sun or other light source, water and carbon dioxide in the air to make their own food and while consumers must depend on plants and other consumers for the energy they need to survive.

Common Misconceptions: Students may not understand the concept of limited resources within an ecosystem, such as the limited availability of some food sources. They also may not understand the inability of animals to switch food sources when they become scarce. For example, a bird cannot choose to eat a snake or a snake to eat grass when their primary food sources disappear.

Also, they may not realize how the change in the population size of one animal might affect the size of another population. For example, fewer insects might mean some bird populations will decrease due to less food. They need to understand the connections between populations in an ecosystem and the interdependent balances that exist between them.
Students may also see ecosystems as stagnant rather than changing systems.

Finally students tend to describe a food chain as one animal eating another. Rather they should see a food chain as the transfer of energy within an ecosystem. The arrows in food chains and food webs are actually meant to show the flow of energy, that originally comes from the Sun, as it moves from organisms in one population to organisms in another population within the chain or web.

Essential Questions:

1) What would happen in an ecosystem if there were several different animal populations competing for the same food source?

Different animal populations competing for the same food might cause the food source to become scarce. If a food source is scarce, then some animals might die or move to different ecosystem. This will cause a decrease in their populations in this ecosystem.

2) What will happen to other organisms within a food chain if the secondary consumer is removed?

If the secondary consumer is removed from a food chain, the primary consumer population will increase which will decrease the number of producers. As the number of producers decreases, the organisms within the primary population are forced to compete for less food. Eventually the primary consumer population will decrease due to starvation or because the organisms in this population leave the ecosystem to find food.

3) What do food chains and webs show?

Food chains and webs show the transfer of energy from the Sun to all the organisms in the chain or web.

4) In what ways do organisms interact with living and nonliving parts of their ecosystem to survive?

Organisms depend on both living and nonliving parts of their ecosystem in order to meet their basic needs. Plants need water and air to make their own food while soil provides important nutrients to keep them healthy as they grow. Decomposers return nutrients to the soil as they break down the bodies of dead organisms.

Animals may use nonliving parts of the ecosystem to provide shelter by living in and around rocky structures or by burrowing in the soil. They also require clean water and air. Animals depend on plants and other animals for food and may compete with other animals for limited resources, which may include water, food sources and places to shelter.

Notes: