

<p>Important Concepts</p> <p>Interdependence</p> <p>6-8 Level</p>	<p>Alaska Science Content Standard C3 Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p>
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Grade Level Expectations:

The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by:

[6] SC3.1 recognizing that organisms can cause physical and chemical changes (e.g., digestion, growth, respiration, photosynthesis) to matter and recognizing the importance of energy transfer in these changes

[6] SC3.2 organizing a food web using familiar plants and animals

[7] SC3.1 recognizing and explaining that organisms can cause physical and chemical changes (e.g., digestion, growth, respiration, photosynthesis) to matter and recognizing and explaining the importance of energy transfer in these changes

[7] SC3.2 classifying organisms within a food web as producers, consumers, or decomposers

[8] SC3.1 stating that energy flows and that matter cycles but is conserved within an ecosystem

[8] SC3.2 organizing a food web that shows the cycling matter

According to AAAS's Benchmarks for Science Literacy*, some of the things that students should know and understand by the end of the eighth grade are:

In all environments, organisms with similar needs may compete with one another for limited resources, including food, space, water, air, and shelter.

The world contains a wide diversity of physical conditions, which creates a wide variety of environments: freshwater, marine, forest, desert, grassland, mountain, and others. In any particular environment, the growth and survival of organisms depend on the physical conditions. Interactions between organisms may be for nourishment, reproduction, or protection and may benefit one of the organisms or both of them. Some species have become so dependent on each other that neither could survive without the other.

One organism may scavenge or decompose another.

Given adequate resources and an absence of disease or predators, populations of organisms in ecosystems increase at rapid rates. Finite resources and other factors limit their growth.

All organisms, both land-based and aquatic, are interconnected by their need for food. This network of interconnections is referred to as a food web. The entire earth can be considered a single global food web, and food webs can also be described for a particular environment. At the base of any food web are organisms that make their own food, followed by the animals that eat them, then the animals that eat those animals, and so forth.

Food provides molecules that serve as fuel and building material for all organisms.

Plants use the energy from light to make sugars from carbon dioxide and water.

*Project 2061, American Association for the Advancement of Science, Benchmarks for Science Literacy. New York: Oxford University Press, 1993.

Plants can use the food they make immediately or store it for later use.

Organisms that eat plants break down the plant structures to produce the materials and energy they need to survive. Then other organisms consume them.

Over a long time, matter is transferred from one organism to another repeatedly and between organisms and their physical environment. As in all material systems, the total amount of matter remains constant, even though its form and location change.

Energy can change from one form to another in living things.

Organisms get energy from oxidizing their food, releasing some of its energy as thermal energy.

Almost all food energy comes originally from sunlight.