



What Is the Pyramid of Energy? Student Information Pages



Imagine you're driving down the road in a car. As you look out the window you notice a stretch of land with plants as far as the eye can see. Grass, flowers, trees, and other plants are visible in every direction. You probably wouldn't be too shocked or surprised. But imagine looking out the window to find animals as far as the eye can see. Snakes, hawks, rabbits, and other animals so thick you'd have to step over them to take a walk!

Why does our world have so much more plant life than animal life?

One explanation is called the Pyramid of Energy. You may know that all living things need energy, from the smallest bacteria to the largest plants or mammals. You may also know that people use food chains and food webs to show how this energy is passed from the sun to *producers* (plants) and then to *consumers* (animals, fungi, bacteria, etc.). What you may not know is that **every time energy is passed from one living thing to the next, only a small portion of the energy makes it to that next living thing.** By the time you get to the end of any food chain, most of the energy that was available at the beginning is no longer available. Scientists came up with the Pyramid of Energy to explain this.

The Pyramid of Energy

The Pyramid of Energy is a model that uses a pyramid shape to show that the energy available for consumers decreases as it travels through a typical food chain or web.

Producers are at the bottom of the pyramid because they are able to transform the sun's energy into a large amount of plant energy through the process of photosynthesis. Producers are the base of energy for most food chains and food webs.

Animals that eat plants make up the next level. These animals are called *primary consumers* because they are the first level of consumers. Primary consumers rely on plants for their energy. This level of the pyramid is smaller than the producer level because most of the energy used at the producer level is used by producers for their life processes (respiration, photosynthesis, reproduction, etc.) and transformed to heat before they are consumed.

Animals that eat primary consumers make up the next level. These animals are called *secondary consumers* because they are the second level of consumers. Secondary consumers rely on primary consumers for most of their energy. This level of the pyramid is smaller than the primary consumer level because most of the energy used at the primary consumer level is used for their life processes (respiration, digestion, reproduction, etc.) and transformed to heat before these animals are consumed.

Animals that eat secondary consumers make up the next level. These animals are called *tertiary consumers* because they are the third level of consumers. Tertiary consumers rely on secondary consumers for most of their energy. This level of the pyramid is smaller than the secondary consumer level because most of the energy used at the secondary consumer level is used for their life processes and transformed to heat before these animals are consumed.

It's possible to have additional levels of consumers, but in most food chains energy runs out by the second or third level.