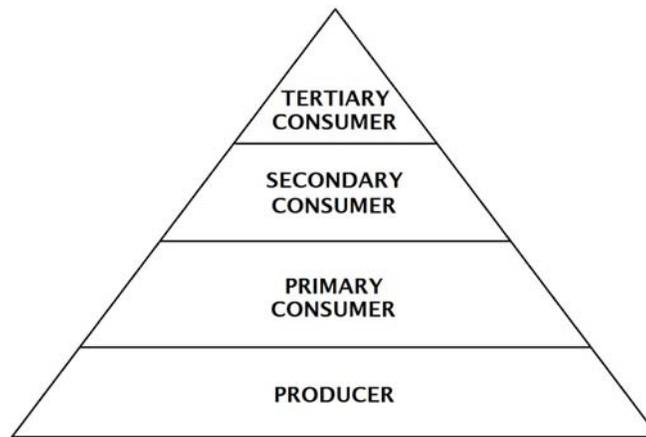


# The Eco Pyramid

By Michael Stahl



An ecosystem is a community of living organisms interacting with one another as well as with nonliving things. One very important aspect of an ecosystem is the energy that flows through it. Energy is exchanged between members of an ecosystem, creating an energy flow and assisting in the continuation of life. However, not all of the organisms living in an ecosystem absorb equal amounts of energy. An eco pyramid effectively illustrates the amounts of energy that are absorbed by the different types of organisms in an ecosystem.

The power of the earth's sun gets the energy flow of most ecosystems going. Solar rays enter the earth's atmosphere and reach the surface where plants utilize the energy from them. Through a process called photosynthesis, plants like trees, grass, and bushes, create food for themselves. Plants are able to take in carbon dioxide from the atmosphere, and their roots absorb water from the surrounding soil. Plants then use the solar energy and the hydrogen from water to transform the carbon dioxide into a nourishing carbohydrate. With photosynthesis complete and food and energy absorbed, the plants release the oxygen part of the water that they had taken from the soil back out into the atmosphere. Other living things, like human beings, take in oxygen in the breathing process. The plants of an ecosystem are called "autotrophs," which means "self-feeders." They are also called "producers" in an ecosystem.

The carbohydrates that were produced by the photosynthesis process give the plant energy to continue on living. Herbivores are animals that eat mostly, if not strictly, plant life. Termites, koalas, field mice, and deer are a few examples of herbivores. Deer feed on leaves and grass, consuming the green plant life's energy. To consume means to eat something and absorb its nutrients for survival. After eating the plants of their choice, deer will then digest the plants and use whatever nutrients the plant had stored inside to create energy so that they can

continue to live. The herbivores of an ecosystem are called “primary consumers.” Some of the energy that the herbivores use is lost in the ecosystem when they create body heat. For example, when deer run and their bodies warm up, the excess heat within their bodies escapes into the atmosphere. If that did not happen, the deer’s bodies would get too hot and their organs would fail to work any longer.

Energy is transferred again in an ecosystem’s energy flow from primary consumers to “secondary consumers.” Carnivores, or meat eaters, act as secondary consumers. Lions, tigers, and polar bears are carnivorous. They eat the meat of the herbivores after a hunt. When tigers eat their prey’s meat, they go on to digest it and use the energy from it for their own survival. Like the herbivores in the previous section of the energy flow, carnivores also give off heat energy when their bodies warm up from exercise. Unfortunately for the carnivorous secondary consumers, they too will eventually find themselves targeted for their energy by other members of their ecosystem: the tertiary consumers.

Secondary consumers are carnivorous predators, meaning that they hunt down other animals and kill them for food. However, these animals are not at the very top of the food chain and they too can be hunted and utilized as a meal. Tertiary consumers are predators who lie at the top of the food chain. Human beings are the most obvious example of a tertiary consumer. Unlike the secondary consumers, tertiary consumers are not normally preyed upon by other members of the ecosystem.

Like the primary and secondary consumers, the tertiary consumers give off body heat. That energy is released into the atmosphere. Even if consumers or producers aren’t hunted or eaten, all living things eventually die. When they do, they decompose. Bacteria and fungi attach themselves to a dead producer or consumer and begin to break down the matter of the body, releasing nutrients into the soil. These nutrients are then used to give life to new plants so that new energy from the sun can flow through the eco pyramid.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. What is an ecosystem?

- A a process in which plants take carbon dioxide from the atmosphere and hydrogen from water, and release oxygen into the atmosphere
- B a group of living organisms interacting with one another as well as with nonliving things
- C a predator that lies at the top of the food chain and may feed on plants, primary consumers, or secondary consumers
- D an organism that attaches itself to dead tertiary consumers and breaks down the matter of their bodies

2. What is a list of the types of organisms in an eco pyramid?

- A nonliving things, bacteria, fungi, sunlight, water secondary consumers, tertiary consumers
- B primary consumers, deer, bacteria, fungi, nonliving things, tertiary consumers
- C producers, primary consumers, secondary consumers, tertiary consumers
- D producers, primary consumers, secondary consumers, carbohydrates, water

3. In an ecosystem, primary consumers eat plants. Secondary consumers eat primary consumers. Tertiary consumers eat secondary consumers.

What can be concluded from this information?

- A Plants need both carbon dioxide and water for photosynthesis to occur.
- B Different types of organisms within an ecosystem need each other to live.
- C Bacteria and fungi are needed to break down the dead bodies of producers and consumers.
- D Light from the sun is necessary for most ecosystems on Earth to get going.

4. Which members of an ecosystem are part of the energy flow?

- A ONLY the living things in the ecosystem
- B ONLY the nonliving things in the ecosystem
- C living and nonliving things in the ecosystem
- D the energy flow is not dependent on any members of the ecosystem

5. What is this passage mostly about?

- A the energy flow of an ecosystem and the different types of organisms within an ecosystem
- B the function of secondary consumers and their importance to an ecosystem
- C the problems for ecosystems that result from humans hunting animals such as deer and tigers
- D the creation of body heat in primary consumers and the release of that heat into the atmosphere

6. Read the following sentences: "Energy is **transferred** again in an ecosystem's energy flow from primary consumers to 'secondary consumers'. Carnivores, or meat eaters, act as secondary consumers. Lions, tigers, and polar bears are carnivorous. They eat the meat of the herbivores after a hunt. When tigers eat their prey's meat, they go on to digest it and use the energy from it for their own survival."

As used in the passage, what does the word "**transferred**" mean?

- A stopped
- B moved
- C changed
- D destroyed

7. Choose the answer that best completes the sentence below.

Living and nonliving things in an ecosystem interact with each other; \_\_\_\_\_, plants use energy from the sun.

- A on the other hand
- B in the end
- C in particular
- D previously

8. What are herbivores?

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9. What do secondary consumers eat?

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10. If one type of organism described in the passage were removed from an ecosystem, what would happen to the ecosystem? Explain your answer using evidence from the passage.

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## Teacher Guide &amp; Answers

Passage Reading Level: Lexile 1080

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8. What are herbivores?

**Suggested answer:** Herbivores are animals that eat mostly, if not strictly, plant life.

9. What do secondary consumers eat?

**Suggested answer:** Students may answer that secondary consumers eat primary consumers, herbivores, or specific herbivores (e.g., deer).

10. If one type of organism described in the passage were removed from an ecosystem, what would happen to the ecosystem? Explain your answer using evidence from the passage.

**Suggested answer:** Answers may vary, as long as they are supported by evidence from the passage. Students may make the case that if one type of organism were removed, other types of organisms would die. For instance, if plants were removed from an ecosystem, herbivores would die, and then animals that prey on herbivores would die, and so on. Students may also argue that in some cases, an ecosystem would be unaffected by the removal of one type of organism. The disappearance of tertiary consumers, for example, might not interfere with an ecosystem's energy cycle, as bacteria and fungi could continue providing nutrients to the soil by breaking down the dead bodies of primary consumers, secondary consumers, and producers.