The Eco Pyramid

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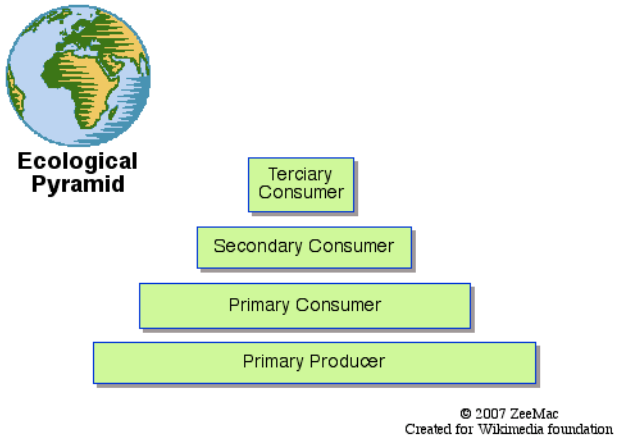

An ecosystem is a group of living organisms going through their life cycles in a particular environment alongside nonliving things. Ecosystems exist because of the interactions between these living and nonliving things. In other words, plants and animals all need each other so that they can continue living; they even need nonliving parts of ecosystems to survive. One very important aspect of an ecosystem is the energy that flows through it. Energy is exchanged between members of ecosystems, creating a cycle and assisting in the continuation of life. However, not all of the organisms living in an ecosystem absorb equal amounts of energy as it travels throughout the cycle. An eco pyramid effectively illustrates which types of organisms absorb various levels of energy in an ecosystem's energy cycle.

The power of the Earth's sun gets the energy cycle of most ecosystems going. Solar rays enter the Earth's atmosphere and fall to 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, enjoy oxygen in the breathing process. The plants of an ecosystem are called "autotrophs," which means "self-feeders."

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." This is because they are the first organisms to eat something else in the ecosystem's energy cycle. 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 cycle when "secondary consumers" begin to carry out their function. 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 cycle, 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. Therefore, the tertiary consumer has a much different role in the energy cycle.

Like the primary and secondary consumers, the tertiary consumers give off body heat. That energy is lost to the energy cycle. For the energy cycle to gain energy from tertiary consumers, they must die. Even if they are not hunted, all living things die, and when they do so, they decompose. Bacteria and fungi attach themselves to a dead tertiary 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 plant life. This means that the energy cycle has been completed and can begin again!

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 going through their life cycles in a particular environment alongside 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 primary producers, primary consumers, secondary consumers, tertiary consumers
D primary 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 tertiary 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 cycle?

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 cycle is not dependent on any members of the ecosystem

5. What is this passage mostly about?

A the energy cycle 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: "Bacteria and fungi attach themselves to a dead tertiary 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 plant life. This means that the energy **cycle** has been completed and can begin again!"

What does the word **cycle** mean?

A to eat something and absorb its nutrients for survival
B a group of living and nonliving things that interact
C a predator that is at the top of the food chain
D a series of events that happens over and over

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?

_____

_____

_____

_____

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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