**ECOLOGY!**

1**Ecology** is the study of how living organisms interact with each other and their environment. An **ecosystem** is a particular place where we see such interactions. Earth has a wide variety of ecosystems. Every ecosystem is defined by the climate and the types of organisms that live there. Ponds, oceans, mountains, deserts, forests, and backyards are all example of ecosystems. These ecosystems are defined by the temperature, pH, mineral availability, water, and soil type of the environment. The environmental conditions determine which organisms will be able to survive.

2Remember, only organisms that are *adapted* to a particular environment will be able to live there. If an organism does not have **adaptations** that allow them to compete for resources, then an organism will not survive. By the process of **natural selection**, the environment chooses the most fit organisms to survive *and reproduce, passing on their genes* to the next generation.

3Organisms have the ability to reproduce and increase their population size *infinitely*. So, what stops populations from increasing forever? *What stops the growth of a population?* Remember that resources are **finite** in nature. There is only a limited amount of space, water, air, and shelter. Likewise, there is a limited amount of food and mates. Because *resources are limited*, population *growth is limited*. The **carrying capacity** of an ecosystem is the *maximum number of organisms that can be supported by the ecosystem.* Meaning, if the population goes past this number, there will not be enough food, space, water, etc. for everyone. Some organisms will not be able to survive. A population will continue to grow until it is at the carrying capacity. At this point, the population will stabilize, or stay close to the carrying capacity limit.

4In an ecosystem, every single living thing has a specific role that it plays. An organism's role in an ecosystem is called its **niche**. An organism’s niche includes where it lives, what it eats, who it is being hunted by, etc. In ecology, there are many roles in an ecosystem that depend on each other. *All parts of an ecosystem are connected*, and if you change one part of the ecosystem, all others will somehow be affected.

5At the base of every ecosystem you will find the **producers**. *Plants are producers* because they *make their own food using energy from the sun*. This process is called **photosynthesis** and it occurs in the **chloroplast** of all plants. Plants are also called **autotrophs**, which means that they *make their own* organic nutrients. Once again, plants use energy from the sun to do photosynthesis and make **glucose**, an organic molecule.

6The energy of plants can be used to feed consumers. **Consumers** are organisms that must ***eat*** other organisms for food. Consumers are also considered heterotrophs. **Heterotrophs** get organic nutrients from *other organisms*. The consumers that feed only upon plants are called **herbivores**. Examples of herbivores are rabbits, cows, and deer. These organisms do not eat meat from other animals; they only eat plants.

7Organisms that rely on eating meat are called **carnivores**. Carnivores do not eat plants. Examples of carnivores are wolves, foxes, hawks, and lions. Carnivores are **consumers** because they eat other animals. Carnivores are **heterotrophs** because they rely on other living organisms to get their organic nutrients.

8As you can see, the original source of energy for all ecosystems is the sun. The energy gets passed along in a “chain” of events. The energy in a **food chain** starts with the sun, and then flows from producers to consumers. More specifically, the energy from the sun flows from photosynthetic plants, to herbivores, to carnivores that are the top of the food chain.

9Perhaps one of the most important roles in the ecosystem is that of the **decomposers.** *Bacteria, mushrooms, and fungi* are decomposers. Their job is to *break down dead organic matter and* ***recycle the nutrients*** *back into the soil*. The nutrients in the soil are used by the plants, and the cycle continues over again for the next generation. Remember that bacteria and fungi are living things, and just like all other organisms, *they need organic nutrients for cellular respiration to make ATP.* Decomposers obtain their nutrients while *breaking down* dead organisms. Because they are relying on other organisms for nutrients, they are heterotrophs.

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class Period:\_\_\_\_\_\_\_\_\_

**Ecosystem Questions:**

1. What is an ecosystem?
2. What are the abiotic factors that define an ecosystem?
3. What is an adaptation?
4. What is natural selection?
5. What are some examples of finite abiotic resources?
6. What are some examples of finite biotic resources?
7. What is carrying capacity?
8. What happens when a population reaches the carrying capacity?
9. What is a niche?
10. What happens if you remove an organism from an ecosystem?
11. What is a producer and who are producers in an ecosystem?
12. Write the equation for photosynthesis:
13. What the organic molecule created in photosynthesis?
14. Where does the energy for photosynthesis come from?
15. What is an autotroph?
16. What is a heterotroph?
17. What is an herbivore?
18. What is a carnivore?
19. Are carnivores and herbivores autotrophs or heterotrophs and why?
20. What is the source of energy that powers the whole ecosystem?
21. Starting with the sun, what is the general flow of energy in an ecosystem?
22. What is a decomposer?
23. What are some examples of decomposers?
24. Explain why decomposers are heterotrophs.
25. Would you also consider a decomposer as a consumer? Why or why not?