S4L1-2: Ecology: Food Energy in Ecosystems

8/17 -10/15

Key Terms

Environment[2]
Organism[2]
Ecosystem[3]
Community[2]
Consumers[2]
Population[2]
Habitat[2]
Producers[2]
Decomposers[3]
Food Chains[3]
Food Webs[3]
Adaptations[3]
Feature[1]
Extinction[2]
Energy Flow[2]
Hibernation[2]
Camouflage[2]
Production[1]
Herbivore[3]
Omnivore[3]
Carnivore[3]
Prey[2]
Predator[2]
Mimicry[3]
Scarcity[2]
Over-populated[2]
Endangered[2]
Extinct[2]
Under-populated[2]
Characteristic/feature[1]
Balance[1]
Role[1]
Predict[2]
Survival[2]
Protection[1]

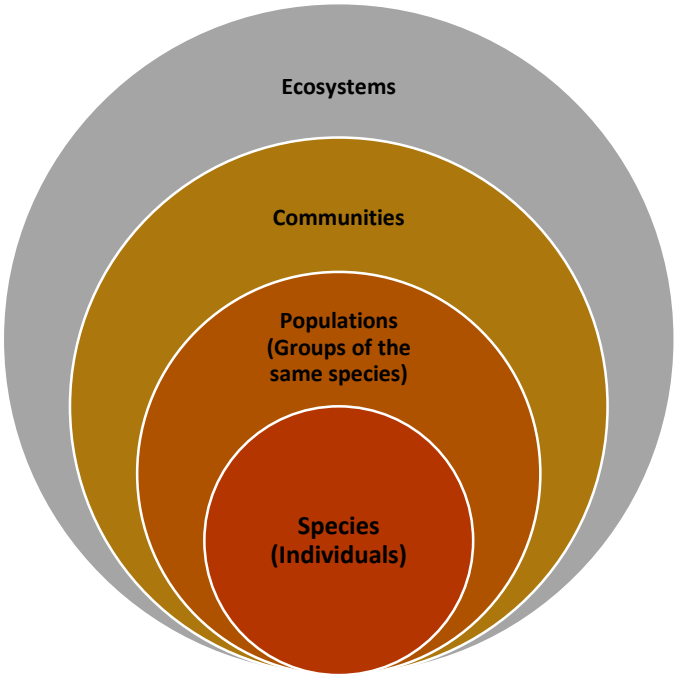
Framework for Teaching:

Students Will Be Able To:

1. Describe environments, ecosystems, communities, populations, and habitats as well as the relationship between each.
2. Arrange species, populations, communities, and ecosystems in order based on size.
3. Describe producers, consumers, and decomposers in a community.
4. Classify producers, consumers, and decomposers based on their roles in a community.
5. Explain the relationship between predators and prey.
6. Compare and contrast producers, consumers, and decomposers.
7. Classify different types of consumers using their general diets.
8. Explain the flow of energy through a food web/chain using visuals and sequencing the process from producers, consumers, and decomposers.
9. Compare and contrast areas that are overpopulated and underpopulated with examples. Additionally discuss the importance of environmental balance.
10. Make predictions based on changes in environments, ecosystems, communities, and populations using cause and effect relationships between scarcity, environmental changes, and other factors.
11. Describe and classify external features and behaviors of organisms that allow them to survive and reproduce more successfully than organism that lack these external features and behaviors.
12. Compare and contrast external features and variations in behavior.
13. Relate adaptations (features and behaviors) to survival and extinction in organisms.

For the teacher to know for their own understanding and to avoid misconceptions:

1. There is a hierarchy of organization from individuals to ecosystems.



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2. Producers use energy from the sun (photosynthesis) or inorganic material (chemosynthesis) to make energy. Chemosynthesis is found mostly in bacteria so stick to teaching plants for age appropriateness (i.e. photosynthesis only).

3. Consumers are classified as herbivores (plant eaters), carnivores (meat eaters), and omnivores (eat plants and animals, omni = all). Use prefixes to help teach vocabulary (see underlined parts).
4. Decomposers break down waste and the remains of dead organisms. The products of these processes are nutrients. Decomposers are the beginning and end of the cycle.
5. Energy is lost as it moves through the food chain/web from producers to consumers. By the time it reaches the top of the food chain there is very little of the original energy processed from the food by the animal.
6. Adaptations are features or behaviors that allow organisms to survive better than other organisms without these behaviors or features. This is directly related to natural selection and evolution so laying a strong foundation is instrumental to future success in advanced life sciences.
7. Make sure that adaptations are classified as either features or behaviors. Instincts are behaviors that do not require cognitive process.

Activities (Suggestions)

- ✓ **Mystery Pellets**
- ✓ **Food Chains (via Georgia Milestones Study Guide)****

Notes:

This unit has a great deal of vocabulary so using word parts and other vocabulary strategies will help students retain the vocabulary for application purposes. The other issue with this unit is that all of the themes are highly dependent upon one another for mastery. Students should classify, compare, and relate all the themes in this unit. For example, understanding the roles of the producers and consumers must be related to the flow of energy in the ecosystem which must then be related to the levels of hierarchy in organization (i.e. communities, populations, etc.) in order to understand how scarcity or overpopulation effects the ecosystem as a whole. You could even add adaptations of consumers for predator/prey relationships to this theme. It is very important to plan this content in a very intentional, sequential manner so that students are able to make sense of the themes within the content. Relying extensively on the sequencing of the textbook can cause issues with cohesiveness between themes.