

Name _____

Unraveling the Web of Life: Understanding Food Webs in Ecology

Open-Ended Response Answer Key

1. In ecology, food webs depict the interconnected feeding relationships between organisms in an ecosystem, whereas food chains represent a linear flow of energy from producers to consumers. For example, in a forest ecosystem, a food chain might show a simple path from grass (producer) to rabbit (primary consumer) to fox (secondary consumer). However, a food web in the same ecosystem would illustrate additional connections, such as rabbits also being preyed upon by owls, and foxes competing with other predators like coyotes. This interconnectedness highlights the complexity of ecological interactions and the importance of considering multiple species in understanding ecosystem dynamics.
2. Decomposers play a crucial role in nutrient cycling within ecosystems by breaking down dead organisms and organic matter. For instance, bacteria and fungi decompose fallen leaves and dead animals, releasing nutrients like nitrogen and phosphorus back into the soil. These nutrients are then taken up by plants, which form the base of the food web and support the growth of other organisms. Without decomposers, organic matter would accumulate, and nutrients would become trapped, limiting the availability of essential elements for living organisms.
3. A tertiary consumer occupies the highest trophic level in a food web and typically preys on secondary consumers. For example, in a marine ecosystem, a killer whale (tertiary consumer) feeds on seals (secondary consumers). This relationship demonstrates the transfer of energy and the regulation of population sizes within the food web.
4. Trophic levels in a food web represent the different positions that organisms occupy based on their feeding habits and energy transfer. Producers, such as plants, are at the base of the food web, followed by primary consumers (herbivores), secondary consumers (carnivores), and tertiary consumers (top predators). Energy flows through these levels as organisms are consumed, with each trophic level supporting the next. For instance, in a grassland ecosystem, grass (producer) is eaten by grasshoppers (primary consumer), which are then consumed by birds (secondary consumers), and so on. This flow of energy maintains the balance of the ecosystem and sustains its biodiversity.

