

Lab: Food Chains and Food Webs

BIOLOGY: CHAPTER 13

Background: What happens to the energy in an ecosystem when one organism eats another? That energy moves along a **one-way path**. Energy flows through an ecosystem in one direction, from the sun or inorganic compounds in **autotrophs** (producers) and then to various **heterotrophs** (consumers). The relationships between producers and consumers connect organisms into feeding networks based on who eats whom. **Food Chains:** The energy stored by producers can be passed through an ecosystem along a food chain, a series of steps in which organisms transfer energy by eating and being eaten. **Food Webs:** In most ecosystems, feeding relationships are more complex than can be shown in a food chain. When the feeding relationships among the various organisms in an ecosystem form a network of complex interactions, ecologists describe these relationships as a food web. A food web links all the food chains in an ecosystem together. Each step in a food chain or food web is called a **trophic level**. Producers make up the first trophic level. Consumers make up the second, third, or higher trophic levels. Each consumer depends on the trophic level below it for energy.

Directions: Using your notes, textbook, and the internet, answer the following questions

Procedure:

1. Design a **food chain** in any ecosystem you chose and complete the data table below. You must include a minimum of **five (5)** trophic levels (the last one being a decomposer). Identify the organisms below:

Trophic Level	Organism name	Producer Consumer Decomposer	Type of consumer Herbivore/Omnivore Carnivore/Decomposer
5			
4			
3			
2			
1			Photosynthetic organism

2. Using page provided in handout, draw a food chain containing these organisms. Label each **trophic level** and draw arrows to show the **“flow of energy”** in your food chain.
3. Using the same ecosystem you selected above, design a **food web** which includes the food chain you described above as well as an additional 10 organisms and draw it on a page provided. These “new” organisms can be located in any of the trophic levels you want. Label each of the trophic levels and each of your organisms. Draw arrows from each organism to show the **flow of energy**.
4. When you are finished with both the food chain and food web, answer the conclusion questions (last page)

FOOD CHAIN (Draw below)

FOOD WEB (Draw below)

Questions:

1. What is a **trophic level**?
2. What is the **ultimate source of energy** for most organisms on our planet?
3. What is the difference between a **food chain** and a **food web**?
4. What is a **decomposer**? Give examples
5. Why is the transfer of energy and matter in a food chain only about **10 percent efficient**?
6. What is an **ecological pyramid**? Describe the three different types of ecological pyramids.

