🔗 Food Chains and Energy Flow

Week 31 — Wednesday | How Animals Depend on Each Other

📖 Reading Time

Every living thing needs energy to survive. In an ecosystem, energy flows from one organism to another through a **food chain**. The energy journey always starts with the **sun**. Plants capture sunlight through **photosynthesis** and convert it into food energy. Animals that eat plants get that energy, and animals that eat those animals get energy too. Scientists call these connections a **food web** because most animals eat more than one thing — the chains connect and overlap like a spider's web!

Every organism in a food chain has a role called a **trophic level**. **Producers** (plants, algae) make their own food from sunlight. They are the foundation of every ecosystem — without them, no other life could exist. **Primary consumers** are herbivores (plant-eaters) like rabbits, deer, and grasshoppers. **Secondary consumers** are carnivores or omnivores that eat herbivores — foxes, snakes, and birds of prey. **Tertiary consumers** are top predators that eat other predators — eagles, sharks, and lions. At the end of every food chain are **decomposers** — fungi, bacteria, and worms — that break down dead organisms and return nutrients to the soil, completing the cycle.

Not all energy passes from one level to the next. About **90% of energy is lost** at each step as heat, movement, and life processes. This means only about 10% of energy moves up the food chain. That's why there are many more plants than herbivores, more herbivores than carnivores, and very few top predators. This energy pyramid explains why ecosystems need a large base of producers to support even a small number of top predators.

When one species changes in an ecosystem, it affects **everything** connected to it. If a predator disappears, the prey population can explode and overeat plants. If plants disappear, herbivores starve, then carnivores starve. This is why **biodiversity** (many different species) is so important — the more connections in a food web, the more stable the ecosystem. A diverse ecosystem can handle changes better because energy has many paths to flow through.

✏️ Reading Questions

1. Where does ALL energy in a food chain ultimately come from?

2. What is the difference between a food chain and a food web?

3. Explain why there are usually more plants than herbivores, and more herbivores than carnivores.

📊 Trophic Levels

Label each trophic level with its role and an example.

Trophic Level	Role	Example from Grassland	Example from Ocean
Level 1	Producer		
Level 2	Primary Consumer		
Level 3	Secondary Consumer		
Level 4	Tertiary Consumer		
End	Decomposer		

📝 Vocabulary Grid

☀️ Photosynthesis

🔗 Food Chain

🕸️ Food Web

🌱 Producer

🐇 Primary Consumer

🦠 Decomposer

🔄 Build a Food Chain

Use the organisms below to create a complete food chain. Write them in order from producer to top predator.

Organisms: Grass | Eagle | Snake | Grasshopper | Frog

Producer → Primary Consumer → Secondary Consumer → Tertiary Consumer → Top Predator

🕸️ Draw a Food Web

In the box below, draw a food web with at least 8 organisms. Connect them with arrows showing which direction energy flows (arrow points to the eater).

🧪 What Happens When a Link Breaks?

Scenario 1: A disease kills most of the frogs in a pond ecosystem. The pond contains algae, dragonflies, frogs, herons, and bass (fish).
Draw the food chain first:

Now explain what happens when frogs disappear:

Scenario 2: Overfishing removes most of the sharks from an ocean ecosystem. The area has phytoplankton, small fish, larger fish, sharks, and sea turtles.
Draw the food chain first:

Now explain what happens when sharks disappear:

✅ True or False

- ○ **1.** All food chains start with the sun.
- ○ **2.** Producers are animals that make their own food.
- ○ **3.** Decomposers break down dead organisms and return nutrients to soil.
- ○ **4.** A food web is made of many connected food chains.
- ○ **5.** About 90% of energy passes from one trophic level to the next.
- ○ **6.** Herbivores are primary consumers.
- ○ **7.** Ecosystems with more biodiversity are generally more stable.
- ○ **8.** Energy in a food chain flows in only one direction.

💭 Think About It

Why are decomposers important even though they don't appear on most food chains? What would happen to an ecosystem without decomposers?