

L5.3B Energy as Fuel for Organisms

Radiant energy obtained through photosynthesis is passed down to organisms on Earth. These organisms use this energy as fuel to live and grow. Energy is passed from the sun to plants and then other organisms that eat the plants.

A **food chain** is a model that shows the path of energy from one organism to another, whether it's a plant, animal, or a fungus.

Radiant energy → Producer → Herbivore → Omnivore → Carnivore
 ← Decomposer ←

➔ = "Passes energy to"

A **(food web)** is a group of overlapping and connecting food chains.

L5.3B Parts of a Food Chain

Producers get their energy from the sun. They produce (make) their own food through photosynthesis.

Consumers must consume (eat) other organisms to gain energy.
3 main types of consumers are grouped by their diet:

- **Herbivores** eat plants (herbs) and have flat teeth
- **Omnivores** eat both plants and animals (omni=both)
- **Carnivores** eat meat and have sharp teeth
 1. *Primary consumers* are herbivores that eat plants.
 2. *Secondary consumers* are carnivores that eat herbivores.
 3. *Tertiary consumers* are carnivores that eat carnivores.

Decomposers “eat” or break down dead organisms and return their nutrients back to the soil. Those nutrients are used to grow plants, thus creating the “Circle of Life”.

L5.3B Ecosystems

An **ecosystem** includes all the interacting living and nonliving things in an environment. Energy within ecosystems flows through food chains and food webs.

Living things in an ecosystem are called *biotic* factors. Nonliving things in an ecosystem are called *abiotic* factors.

Human activity can have negative effects on an ecosystem. Wildlife biologists try to find ways to keep ecosystems healthy and stable.

A biome is an area with a similar climate and ecosystem. Each biome has different and unique organisms that have adapted (changed for survival) to abiotic factors within that biome.

L5.3B Terrestrial Biomes

Biomes are divided into 2 types: *Terrestrial* (land) or *Aquatic* (water)

1. *Terrestrial biomes* include:

- *Forests* (Deciduous) – many trees w/needles or leaves (lose leaves in fall), moderate rain, black bears, deer, red foxes, voles, rabbits, cardinals
- *Evergreen* (Coniferous) – trees stay green all year in higher altitudes, diverse organisms, temperatures vary, moose, beaver, mountain hare, raccoons, raven, eagles
- *Rain forests* – tropical climate, high amounts of rain, tall canopy trees w/large leaves, tree frogs, toucans, monkeys, vines
- *Grasslands* (Prairie USA, Savanna Africa, Steppe Russia, Pampas South America) – fertile soil, tall grasses, less than moderate rainfall, varying temperatures
 - Prairie: elk, prairie dogs, bison, grasshoppers
 - Savanna: elephants, cheetahs, lions, zebras, giraffes, scrub trees, grasses
- *Deserts* – little rain, extreme temperatures, lizards, rodents, camels, cacti, sagebrush
- *Polar tundra* – treeless, frozen soil, caribou, reindeer, arctic foxes, arctic hares, polar bears, plants w/short leaves and short roots

L5.3B Aquatic Biomes

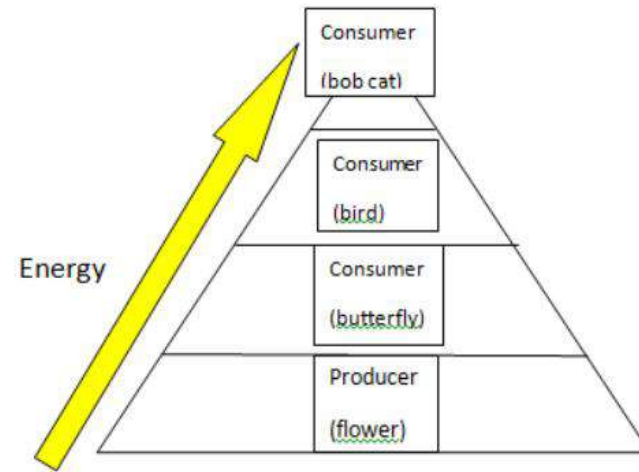
2. *Aquatic biomes* include:

- *Marine/ Saltwater* (oceans, estuaries, coral reefs) – salty water, varying climates, sharks, whales, fish, sponges, plankton, seabirds, crabs, lobsters, clams, marine worms, reptiles, raccoons
- *Freshwater* (rivers, lakes, ponds, streams) – very little or no salt, algae, salmon, frogs, salamanders, ducks, small fish, insects

L5.3B Energy Transfer

Energy Pyramid:

An energy pyramid is a model that shows how much energy flows through a food web. Less energy and organisms are available the higher you go up an energy pyramid.



L5.3B Food Web

A food web is a network of food chains that have some links in common. Just like with food chains, the arrows show the flow of energy.

One organism can be a part of several food chains. Animals have to compete for food, water, sunlight, and space.

Competition is the struggle between organisms for the same resource.

L5.3B Food Webs Change

If one organism is changed in an environment, the whole food web is affected.

When top carnivores are removed from a food web, prey populations are no longer controlled and can reproduce without limits.

When the prey population increases in number, they need more producers to feed them.

Soon there would be not enough producers to feed the organisms.

L5.3B New Organisms Change Food Webs

Exotic species are plant and animal species that are not native to an environment. Example: Elephants are an exotic species for Mississippi

When a new species (invasive species) is introduced to an environment, they threaten native species.

Native species must compete even more for resources to survive. Sometimes the population of exotic species can get out of control and cause major problems for native species.

