Flow of Energy in Ecosystems

Energy Pyramid

- Energy is transferred from one trophic level to another.
- Energy can only flow through the ecosystem in one direction.
- At each trophic level organisms need sufficient energy to heat themselves and reproduce, therefore only ten percent of the energy in each level is transferred to the next higher level.
- Since only ten percent of the energy in a level is transferred to the next, most energy pyramids do not have more than 5 energy levels.
- Animals in higher trophic levels tend to be larger.

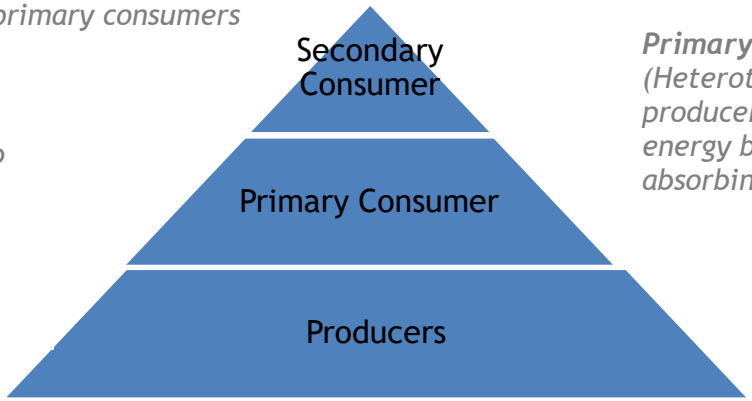
Study Tip

Think of climbing stairs, the higher you climb the less energy you have, so animals on the top of the pyramid only have a fraction of the energy that animals near the bottom of the pyramid do.

The Sun: The energy given off by sunlight fuels the ecosystem

Secondary Consumers: *Prey on primary consumers*

Producers: *(Autotrophs) absorb energy given off by sunlight and stores chemical energy in the form of carbohydrates*



Primary Consumers: *(Heterotrophs) Prey on producers and must obtain energy by eating or absorbing*

Trophic Levels

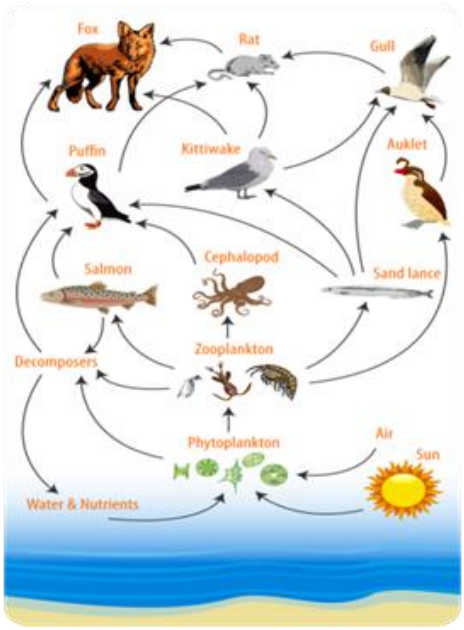
Trophic Level	Individuals in the level	Examples
1	Primary Producers	Grass, Wheat, Seaweed
2	Primary Consumers (Herbivores)	Rabbit, Deer

3	Secondary Consumers (Carnivores)	Snake, Toad
4	Tertiary Consumers (Carnivores)	Bears, Lions, Hawks

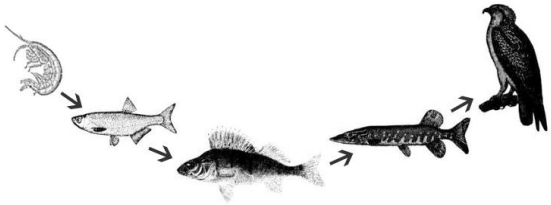
Food Web and Food Chain

- A **food chain** is as system of organisms that transfer energy from one trophic level to another
- A **food web** shows the movement of energy through an entire ecosystem

In a food web, organisms in a larger part of an ecosystem are interconnected with one another. The food web shown here covers both aquatic and land ecosystems



The food chain depicted here starts with plankton (producer), and ends with a hawk (secondary consumer). Food chains follow a specific path within the food web



Concept Check

- What is the purpose of an energy pyramid?
- What percent of the energy in a level is transferred the next higher level?
- What does a food web show?