Energy Flow

- The flow of energy through an ecosystem is one of the most important factors that determines the system's capacity to sustain life.

- **Sunlight** is the main energy source for life on Earth. Some organisms rely on energy stored in inorganic chemical compounds.

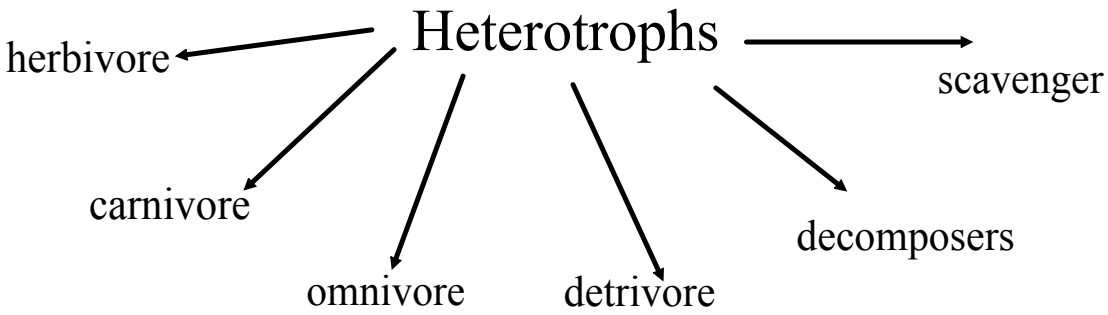
- **Autotrophs** (producers) capture energy from sunlight or chemicals to produce their own food. PHOTOSYNTHESIS

carbon dioxide + water ---light----> carbohydrates + oxygen

$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

- Organisms that rely on other organisms for their energy and food supply are called **heterotrophs** (consumers). These include animals, fungi and bacteria.

- When organisms use chemical energy to produce carbohydrates, the process is called **chemosynthesis.** The process is performed by several types of bacteria that live in volcanic vents, hot springs and tidal marshes.



Herbivores, such as cows, obtain energy by eating only plants.
Carnivores, such as snakes, eat only animals.
Omnivores, such as humans, eat both plants and animals.
Detrivores, such as earthworms, feed on dead matter.
Decomposers, such as fungi, break down organic matter.
Scavengers, such as vultures, consume the carcasses of other animals.

Feeding Relationships

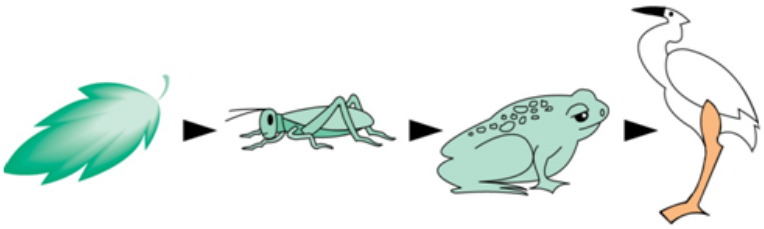
When one organism eats another, the energy in an ecosystem moves along a one-way path.

Energy Flows

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 Chain

The arrows in a food chain show what eats what. The arrow replaces the phrase "is eaten by." The direction of the arrow is very important. The arrow must point toward the "eater."



Leaf → Grasshopper → Frog → Heron

Example #1 - Prairie Ecosystem

grass → grazing antelope → coyote

Example #2 - Marine Ecosystem

algae → zooplankton → herring → squid → shark

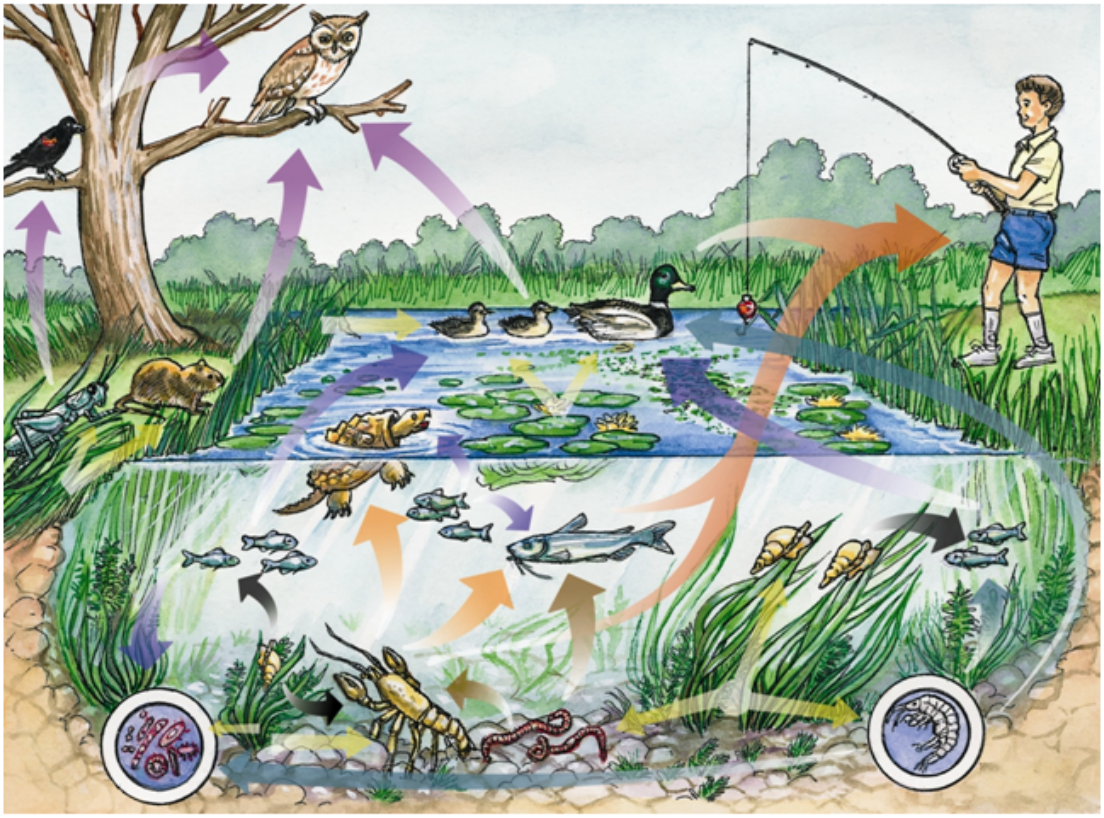
- In most ecosystems, feeding relationships are more complex then can be shown in a food chain.

- When the feeding relationships among various organisms in an ecosystem form a network of complex interactions, ecologists describe these relationships as food webs.

A **food web** links all the food chains in an ecosystem together...

Food Web

A food web shows the many possible food chains that exist in an ecosystem.



http://safeshare.tv/w/sSWvtHMADh

EXERCISE...

Boreal Forest Food Web

Colour and label this food web
Connect the plants and animals to make a food web!