

## Day 11—Energy Flow thru Ecosystems

**An ecosystem is made up of organisms and their environment.** Ecosystems contain *biotic factors* (“living” factors, like organisms or their by-products) and *abiotic factors* (“non-living” factors, like rocks or water).

**Herbivore** – eats herbs - plants: a cow, gazelle, etc.

**Carnivore** – carne – meat; meat eaters; lions, tigers

**Omnivore** – eats plants and meat: bears, raccoons.

**Producer** – produces food for the world - plants

**Consumer** – eats producers – animals

**Decomposer** – recyclers of the ecosystem; eat dead organisms: mushrooms, fungi.

### Organism interactions—

**Symbiosis:** two organisms living together. 4 types:

**Mutualism:** Both are benefited. Ex: bees and flowers.

**Commensalism:** One doesn’t care. Ex: a bird living in a tree.  
Good for bird; tree doesn’t care.

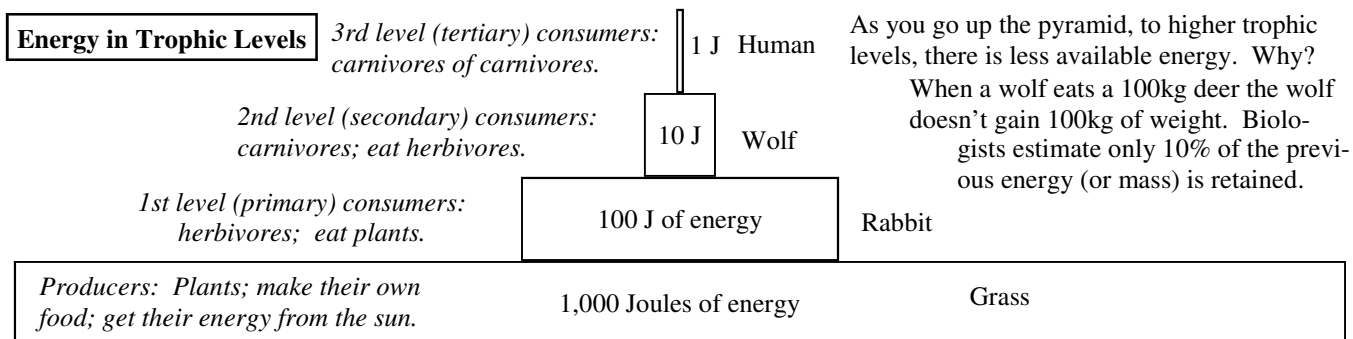
**Predation:** Once kills and eats the other. Ex: Lion and a gazelle.

**Parasitism:** One eats the other but the other doesn’t die;  
Ex: Mosquitoes eating blood of humans.

- Biotic or Abiotic Factor?
 

A. ____ Ice.	C. ____ Deer.	E. ____ Manure (animal waste)
B. ____ Seeds or nuts.	D. ____ Weather	F. ____ Elevation.
- Give two biotic and two abiotic factors in a tropical island ecosystem.
- What kind of symbiosis?
 

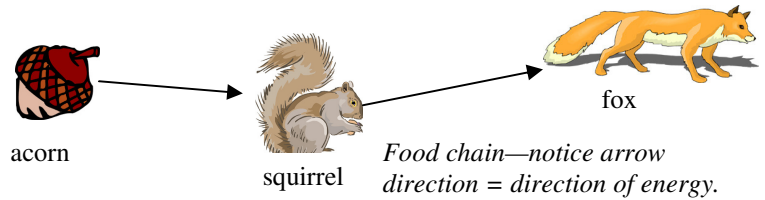
A. Barnacles (a kind of shellfish) live on whales. Barnacles are filter feeders (eat organisms from the water that passes through it). Living on the whale gives a barnacle greater food access since the whale moves, allowing more water to pass through it.	C. Vampire bats suck the blood of cows.
B. Dogs living with humans.	D. Birds scrounging for worms after a farmer plows a field.
- When you eat a salad you are an \_\_\_\_\_. When you eat meat you are a \_\_\_\_\_.  
But human’s eat both plants and meat so actually humans are \_\_\_\_\_.



- Producers, 1st Level Consumers; 2nd Level Consumers; 3rd Level Consumers?
 

A. ____ A cow.	E. ____ Has the most amount of mass in an ecosystem.
B. ____ The least amount of energy in an ecosystem.	F. ____ A fox when it eats a snake, which eats a mouse.
C. ____ Humans when we eat vegetables	
D. ____ A lion.	
- If there is 50 joules of energy at the tertiary consumer level of an ecosystem, how much energy was in the producer level?

**Food Chain** – A *single chain* of organisms that shows who-eats-who. Arrows point to where energy flows (to the eater: from broccoli to you). For instance: energy of squirrel goes to fox (fox eats squirrel).

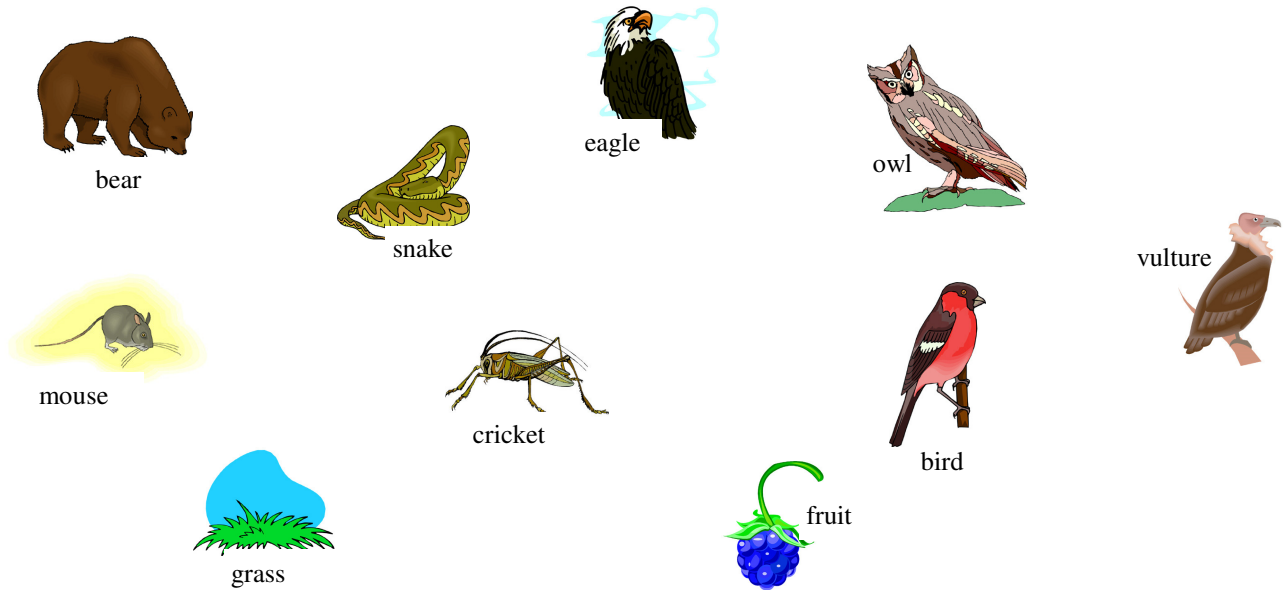


**Food Web** – a group of multiple, interwoven Food Chains for a particular biome.

7. Of the organisms shown below give an example of a:

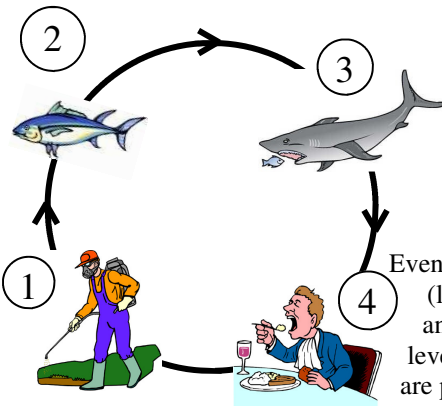
- |                        |                |                                   |
|------------------------|----------------|-----------------------------------|
| A. Predator:           | D. Decomposer: | G. A carnivore of carnivores:     |
| B. Herbivore:          | E. Producer:   | H. A 1st level consumer:          |
| C. 1st level consumer: | F. Omnivore:   | I. Least energy in the ecosystem: |

8. Below, draw a food web consisting of at least four food chains. Be careful of the arrow directions.



**Biomagnification**

Animals ingest (eat) pollution. Over time the amount of toxins in their bodies builds up.



Toxic pollution (oil, pesticides, fertilizer, metals) are used and get in the water or environment.

Eventually, top predators (like humans) eat fish and animals with high levels of pollution. We are poisoning ourselves.

Each big fish eats many little fish. The amount of toxins increases substantially as you go up the food chain.

9. What is a toxin?
10. Give two ways that toxins get into the environment.
11. Which of the animals above would have the most toxins due to biomagnifications?
12. True or false (and why): pollutants in the environment only hurt animals and not humans.

*In the 1960's bald eagles almost went extinct because of DDT, a very powerful and common pesticide. By banning DDT, improving water quality, and protecting habitat, bald eagles are no longer threatened. But others are...*

