Energy Flow in Ecosystems
Science 10 Notes

Energy Flow

- Biomass is the total mass of all living things in a given area
- Within an organisms niche, the organism interacts with the ecosystem by:
  - takes energy from the ecosystem
  - give energy to the ecosystem

Producers and Consumers

- plants are producers, because they produce carbohydrates from carbon dioxide, water and the sun's energy
  - This process is called photosynthesis
- consumers get their energy by eating producers, or other consumers
- decomposition is the breakdown of wastes and dead organisms by organisms called decomposers. This process is called biodegradation.

Energy Flow Diagrams

- Energy flow can be represented in 3 different ways:
  - Food chain
  - Food web
  - Food pyramid

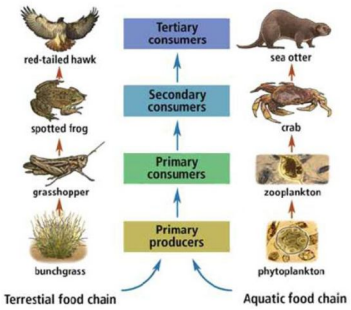
Consumers in Food Diagrams

- herbivores - primary consumer
  - Eat plants only
- carnivores - eat non-producers
  - May eat herbivores or other carnivores.
- omnivores - are special types of consumers that eat both plants and animals
  - Note: omnivores are not necessarily the top of the food chain
- detrivores - consumers that obtain energy and nutrients from dead organisms and waste matter
  - Feed on all levels of the food chain
  - Have their own separate food chains and are very numerous.

primary consumer eats producers.

detrivores = decomposer

Food Chains



- Show energy flow
- Each step is a trophic level
- Trophic levels are numbered from bottom to top
- producers occupy the 1st trophic level
- primary consumers eat producers, and are at the 2nd trophic level
- secondary consumers eat primary consumers, and are at the 3rd trophic level
- top level has top carnivore/consumer.

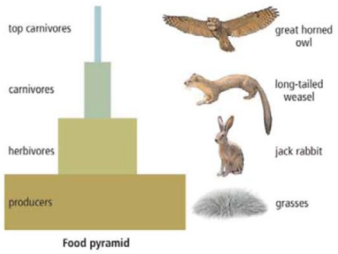
4th trophic level
3rd trophic level
2nd trophic level
1st trophic level

Food Webs (more complex than food chains)

- Can show multiple interconnected food chains
- Models the total energy flow in an ecosystem
- Arrows show the flow of energy and nutrients

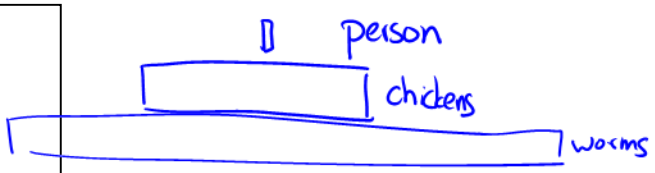
Food Pyramids (Also known as ecological pyramid)

- Shows the change in available/stored energy from one trophic level to the next
- It takes a large number of organisms at one trophic level to meet the energy needs of the next trophic level
  - Each level loses large amounts of energy
  - 80-90% of consumed energy is used by chemical reactions and is lost as heat energy
  - very little is left over for growth or biomass
- The amount of life that an ecosystem can sustain depends on the size of 1st trophic level
- It is important for an ecosystem to maintain biodiversity, at the lowest trophic levels
- biodiversity is very important to maintaining a healthy ecosystem



Food pyramid

Food pyramids may show biomass, or population, or amount of energy



if one food source is reduced in number, consumers can shift to an alternate food.

Assignment:

- Practice p16-18 from your workbook.