**2.1 Energy Flow in Ecosystems**

* Biomass is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Biomass can also refer to the mass of a particular type of matter, such as organic materials used to produce biofuels.
  + Biomass is generally measured in \_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_.
* Within an organism’s niche, the organism interacts with the ecosystem by:
  + 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_from the ecosytem.
    2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to the ecosystem.
  + Plants are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they produce sugars

from carbon dioxide, water and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.

* + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ get their energy by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

or other consumers.

* + Decomposition is the breakdown of wastes and dead organisms

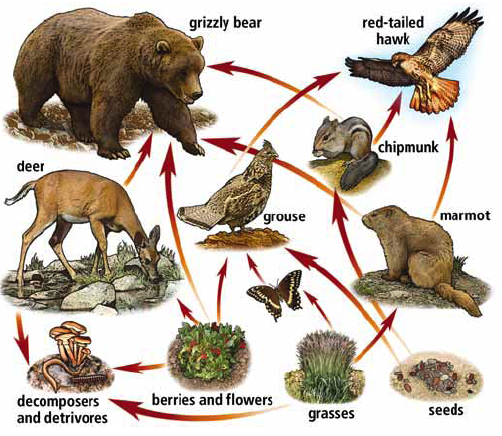
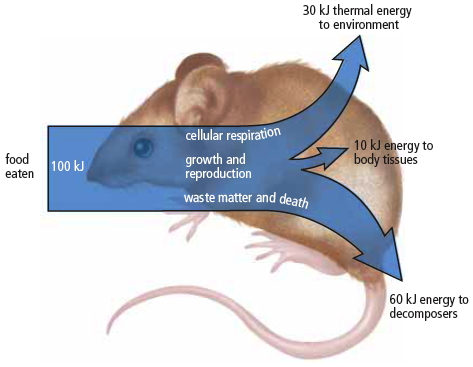
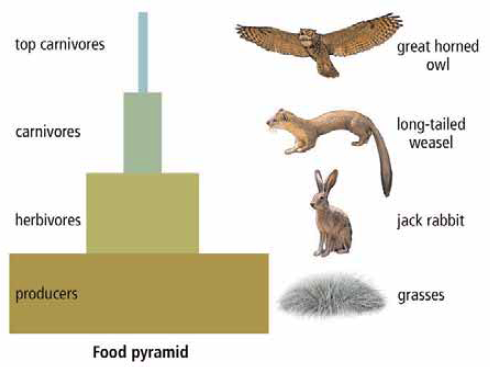
by organisms called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_through the process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Scientists use different methods to represent energy moving through ecosystems.
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Food chains show the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in an ecosystem
* Each step in a food chain is a \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = 1st trophic level
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = 2nd trophic level
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = 3rd trophic level
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = 4th trophic level
* Consumers in a food chain can be classified as:
  1. Detrivores - consumers that obtain energy and nutrients from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + - Examples include \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_.
    - Detrivores feed at every trophic level.
    - Detrivores have their own, separate food chains and are very numerous.
  1. Herbivores – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + Herbivores eat \_\_\_\_\_\_\_\_\_\_ (producers) only.
  2. Carnivores – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + Secondary consumers eat non-producers, such   
       as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
     + Tertiary consumers eat secondary consumers.
       - Also called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  3. Omnivores – consumers that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + Examples include humans and bears.

Most organisms are part of many food chains.

* Food webs represent interconnected \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Food webs are models of the feeding relationships in an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Arrows in a food web represent the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Following the arrows leads to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Food pyramids show the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from one trophic level to another in a food chain.
  + Energy enters at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (producers), where there is a large amount of biomass and therefore much energy.
  + It takes large quantities of organisms in one trophic level to meet the energy needs of the next trophic level.
    - Each level loses large amounts of the \_\_\_\_\_\_\_ it gathers through basic processes of living.
    - 80 – 90 percent of energy taken in by consumers is used in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the body and is lost as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - There is very little energy left over   
      for \_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Food pyramids are also known as ecological pyramids.
  + Ecological pyramids may show \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + The amount of life an ecosystem can contain is based on the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ of the ecological pyramid, where \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_capture energy from the \_\_\_\_\_\_\_\_\_\_.
  + Each level in the energy pyramid = a loss of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - Lower trophic levels have much larger \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than upper levels.
    - This shows the importance of maintaining large, biodiverse populations at the lowest levels of the food pyramid.