**Energy Flow Pyramids**

Revised June 2014



**TROPHIC LEVELS**

An organism’s trophic (feeding) level is determined by its\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

There are 3 main trophic levels in a food web. They are:

1. AUTOTROPHS:

* Capture energy from the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (photosynthetic) or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_molecules (chemosynthetic) and converts it into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Also known as (AKA) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + produces food (make energy storing molecules),
    - Eg.
* 2. HETEROTROPHS-
* AKA **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + obtains the energy to build their molecules by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plants or other organisms

Includes:

* + primary,
  + secondary,
  + tertiary (etc.) consumers, and
  + decomposers and detritivores
* 3. SAPROTROPHS-

AKA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

An organism that feeds off of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organic matter

Examples:

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DETRITIVORES

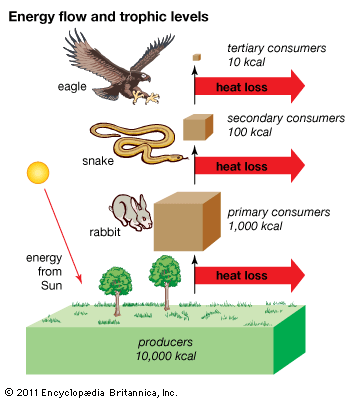
Organisms that eat detritus, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + Eg. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DECOMPOSERS

A kind of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + Break down organic matter into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - release \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ back into the environment to be recycled.
      * Eg. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ENERGY**

Organisms convert food (\_\_\_\_\_\_\_\_\_\_\_) into \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

This energy is given off as \_\_\_\_\_\_\_\_\_\_\_\_ which is lost to space.

Energy is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is not a cycle.

**Energy Flow Pyramids**

An energy flow pyramid is a diagram that compares \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ used by producers, primary consumers, and other trophic levels.

* As a rule each trophic level receives only \_\_\_\_\_\_\_\_\_\_ from the trophic level below.
* In other words each trophic level loses \_\_\_\_\_\_\_\_\_\_\_\_ heat to the atmosphere.

Study the food web below and convert it into an energy pyramid model. The autotrophs in this food web start off with 123,000 kilojoules of energy and the decomposers are included on the outside of the pyramid. Also label the levels with the following terms:

Autotroph

Producer

Primary consumer

Secondary consumer

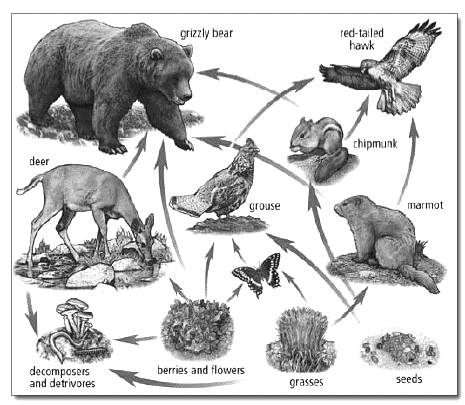
Tertiary consumer

Herbivore

Carnivore

Heterotroph

Decomposer/Detritivore



**BIOMASS PYRAMID**

Biomass is the mass of organisms minus water. Biomass refers to the amount of carbon and other trace elements in an organism’s body contains.

Study the food web below and convert it into a biomass pyramid model. The autotrophs in this food web start off with 5,693,112 Kg of biomass and the decomposers are included on the outside of the pyramid. Also label the levels with the following terms:

Autotroph

Producer

Primary Consumer

Secondary Consumer

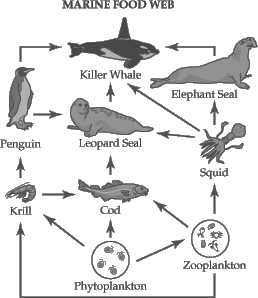
Tertiary Consumer

Herbivore

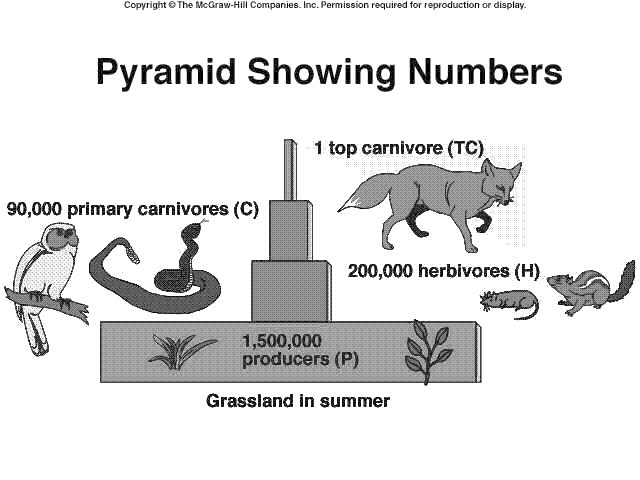
Carnivore

Heterotroph

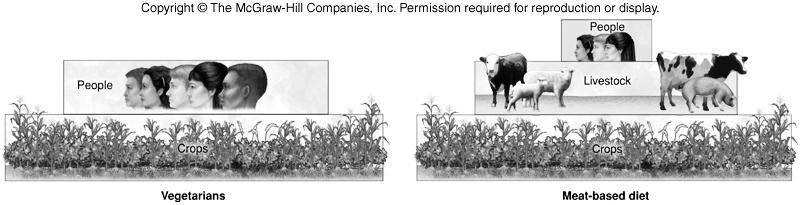
Decomposer/Detritivore

[](http://www.google.com/url?sa=i&rct=j&q=water+food+web&source=images&cd=&cad=rja&docid=3ILBcobs9NRuyM&tbnid=b6YtXsnoIfGr4M:&ved=0CAUQjRw&url=http://mdk12.org/instruction/clg/public_release/biology/G3_E5_I3.html&ei=wFO7Ud36NMWSqwHLyIDoAQ&bvm=bv.47883778,d.aWM&psig=AFQjCNGUOuyty3QQtfZ7APf9yICqavj5zA&ust=1371317471077120)

**NUMBERS PYRAMID**

[](http://www.google.com/url?sa=i&rct=j&q=&source=images&cd=&cad=rja&docid=9wKjqL3cB3zvCM&tbnid=Sy898EQbsLGDdM:&ved=0CAUQjRw&url=http://faculty.southwest.tn.edu/rburkett/ES%20-%20%20understanding_the_environment.htm&ei=3C2_UYHINsG8rgGL8oGgDQ&bvm=bv.47883778,d.aWM&psig=AFQjCNFuXJhLXzvkfGq3wNefPUaP1YqVww&ust=1371569947352438)A graphic showing the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at each trophic level. In this graph you can see that it shows approximately 90% loss of individuals at each trophic level.

**HUMAN POPULATION GROWTH**

[](http://www.google.com/url?sa=i&rct=j&q=vegetarian+ecological+pyramid&source=images&cd=&cad=rja&docid=wK3lskog8oWcuM&tbnid=K0KzLxkUGqma0M:&ved=0CAUQjRw&url=http://www.trunity.net/sam2/articles/view/177341/&ei=8T2_Ub2LHpLlqAGbkYDoBg&bvm=bv.47883778,d.aWM&psig=AFQjCNGDrf0K0LnHyGgVe8_IuwTy5RTDqw&ust=1371574094882486)How can more people be supported on Earth when there is a limited supply of resources? It depends on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_