

## Energy Flow Through Ecosystems :

- solar energy is the driving force behind most ecosystems
  - captured by **producers**, changed into chemical energy (in the form of sugars and starches) during photosynthesis
  - chemical energy is either used inside cells for growth and repair, or stored somewhere in the plant
- producers are eaten by **herbivores (first order consumers)**, but most of the energy they eat is lost during cell processes (like making heat and moving the organism around), so only about 10 % of the energy eaten is stored.
- herbivores are eaten by **carnivores (second order consumers)**, and the same thing occurs. Most of the food energy is used up during cell processes again, and only a small fraction of the food energy is stored in the carnivore.
- in many food chains, these carnivores are in turn eaten by **even larger carnivores (tertiary consumers)**, which often must spend a great deal of energy moving constantly and trying to make a kill. This means there is little of the original food energy left, and they must eat as often as they can to keep their big energy demands fed. This lack of energy and a considerable amount of competition limits their numbers !

- this movement and loss of energy up the food chain is summarized as a Pyramid of Energy diagram.
- the size of the producer group, the herbivore group, and the carnivore group is summarized as a Pyramid of Numbers diagram.
- the weight of each of these three groups is summarized as a Pyramid of Biomass diagram.