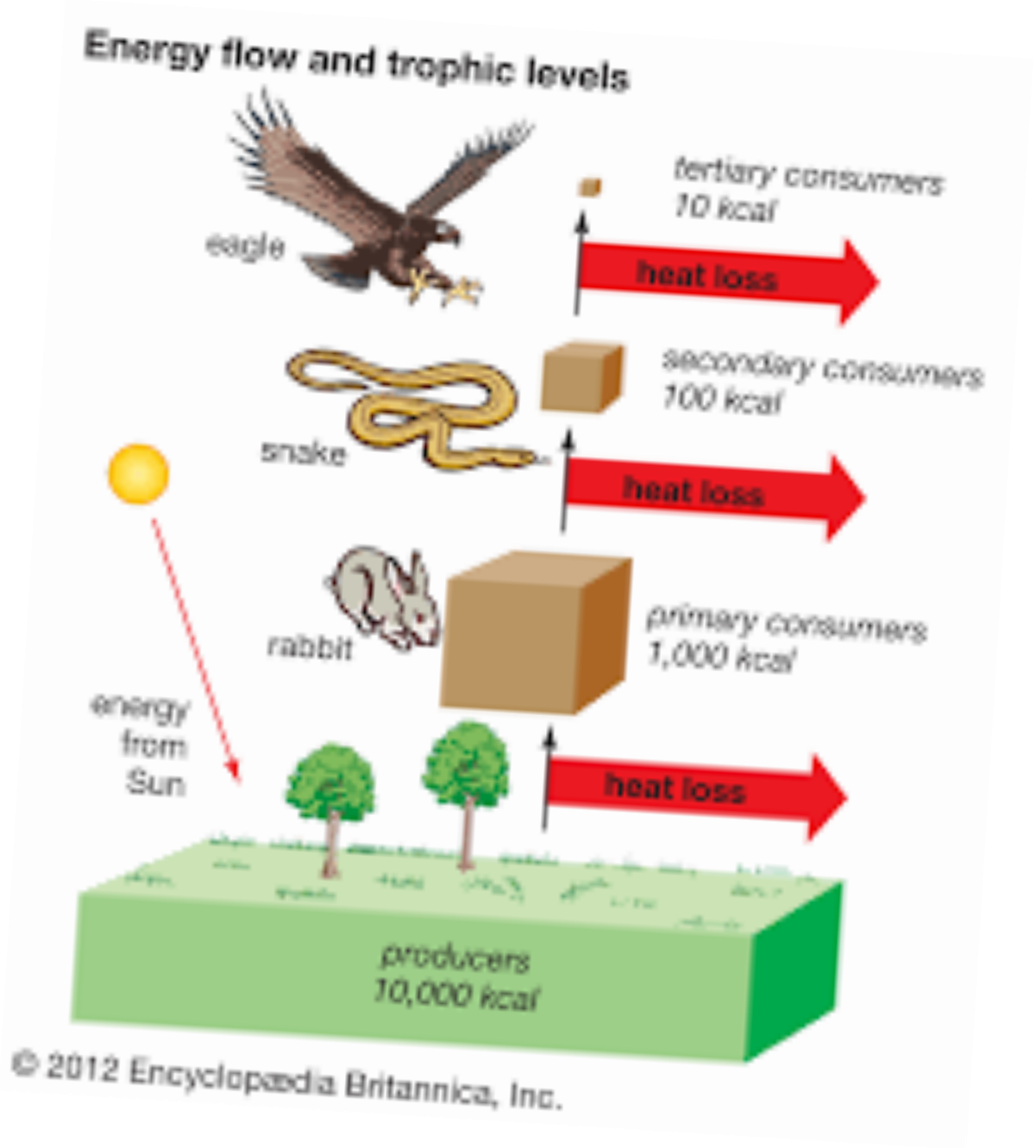
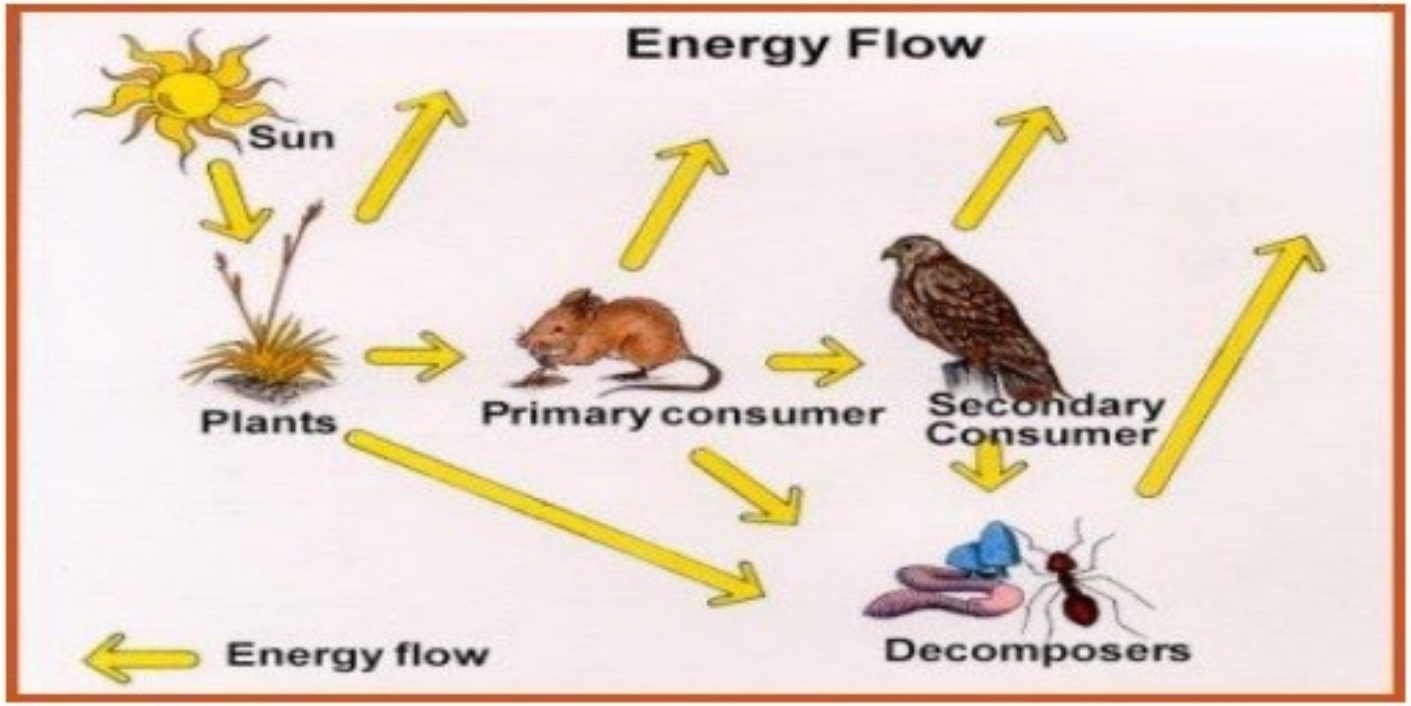
ENERGY FLOW

- in terms of energy flow, an ecosystem is an open system; there is energy input and energy output
- as energy is transferred from one trophic level to the next, there is a change in energy from potential energy to kinetic energy
- Energy loss from the system is in the form of heat or infrared



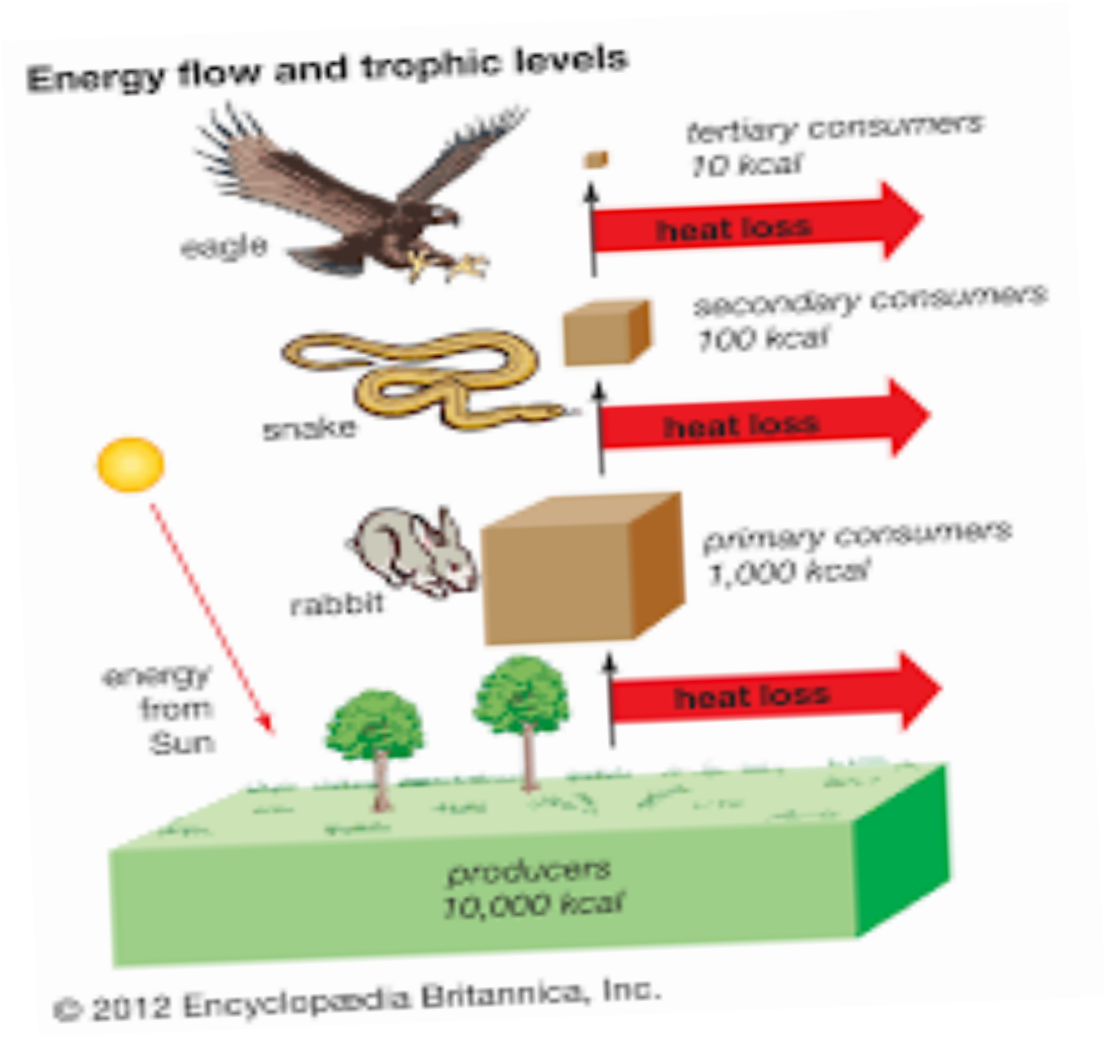
LAWS OF THERMODYNAMICS

- is seen in the flow of energy in an ecosystem
- 1ST LAW – energy cannot be created or destroyed only converted or transformed (**conservation of energy**)
- 2ND LAW - during the transfer of energy, **some energy is always lost as heat**; thus, less energy is available at each higher trophic level.



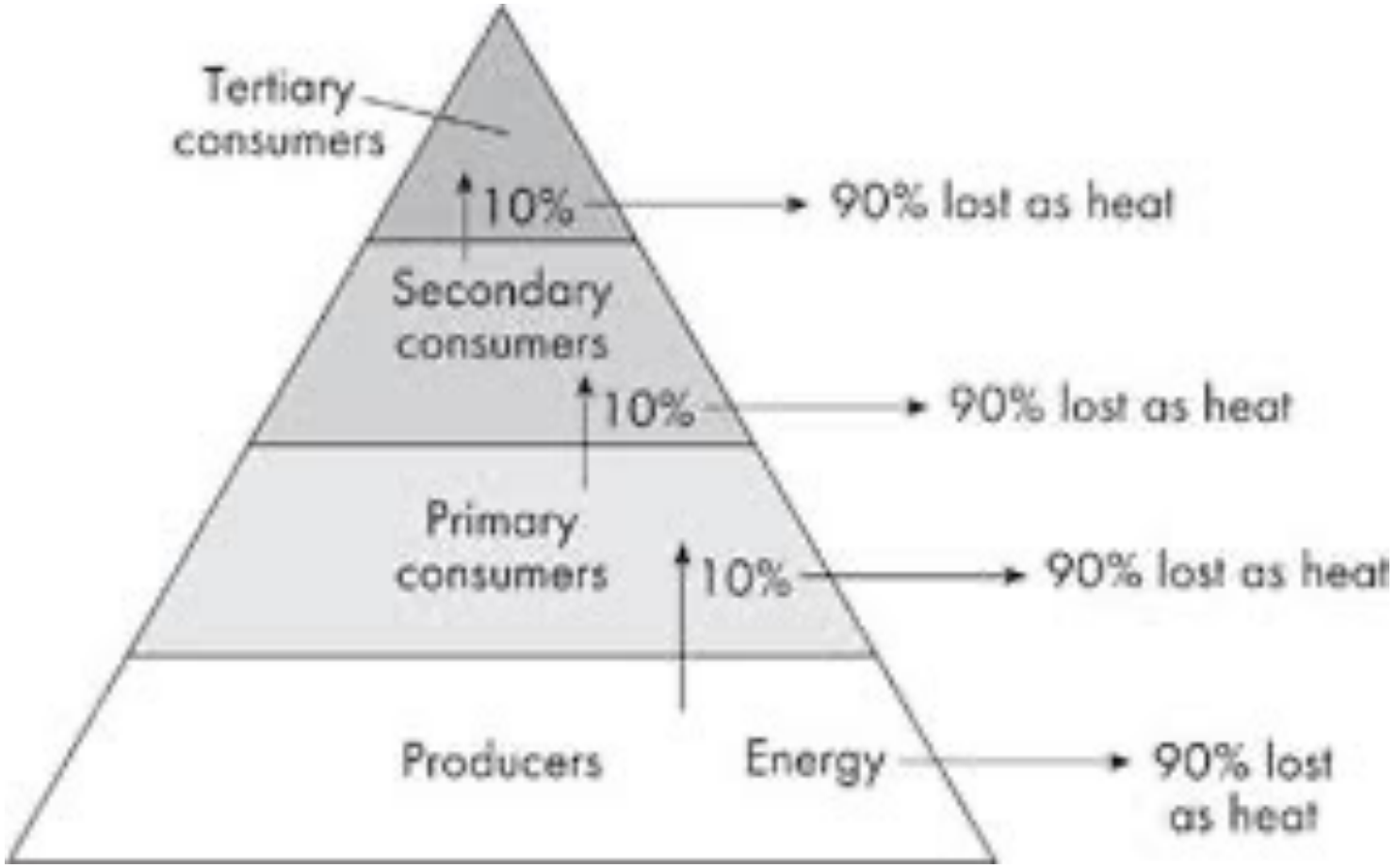
1ST LAW OF THERMODYNAMICS

Energy cannot be created or destroyed only converted or transformed.



2ND LAW OF THERMODYNAMICS

- There is loss of energy in the form of heat/infrared, hence, there is less energy available at each trophic level.

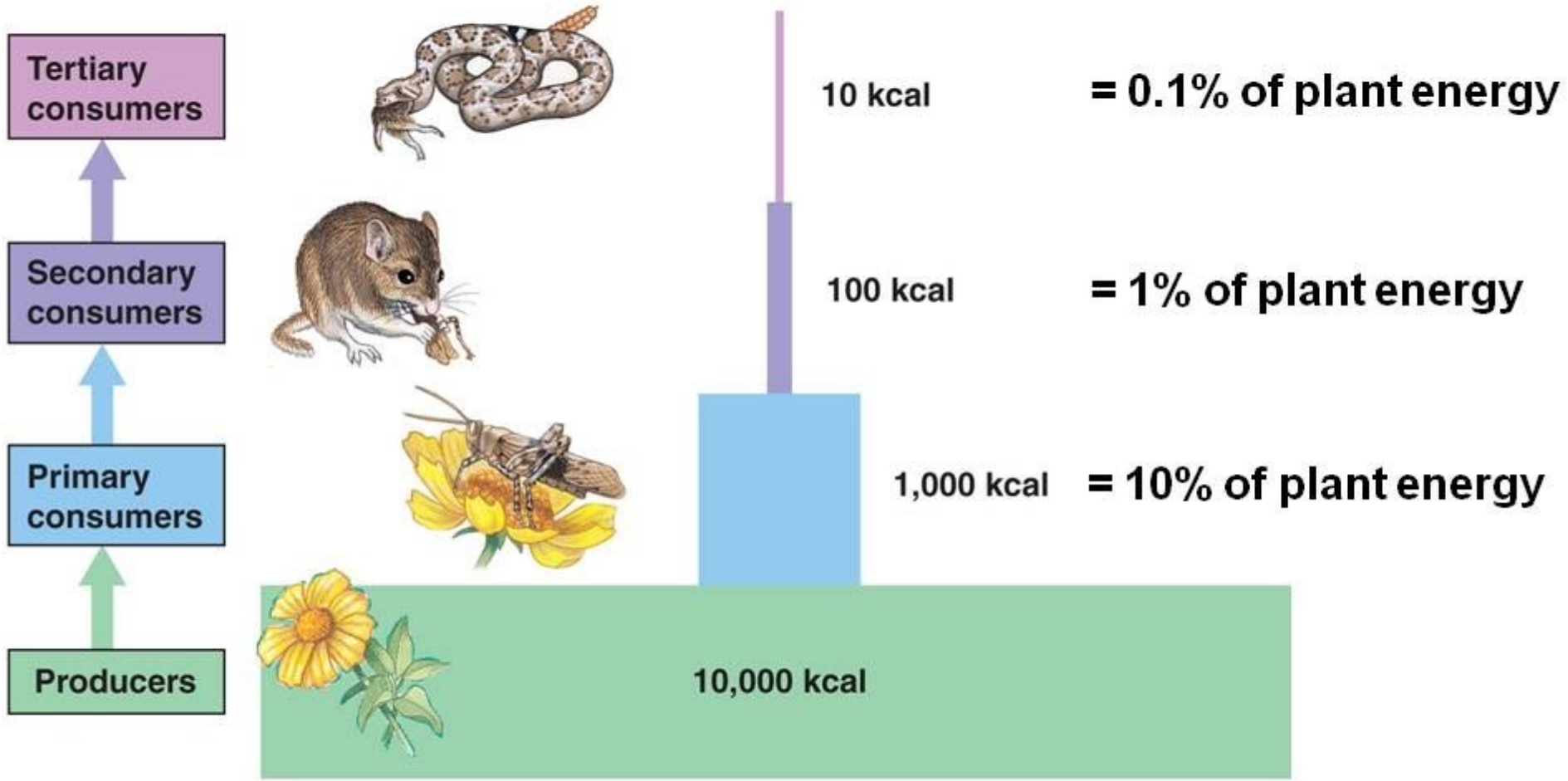


10% RULE

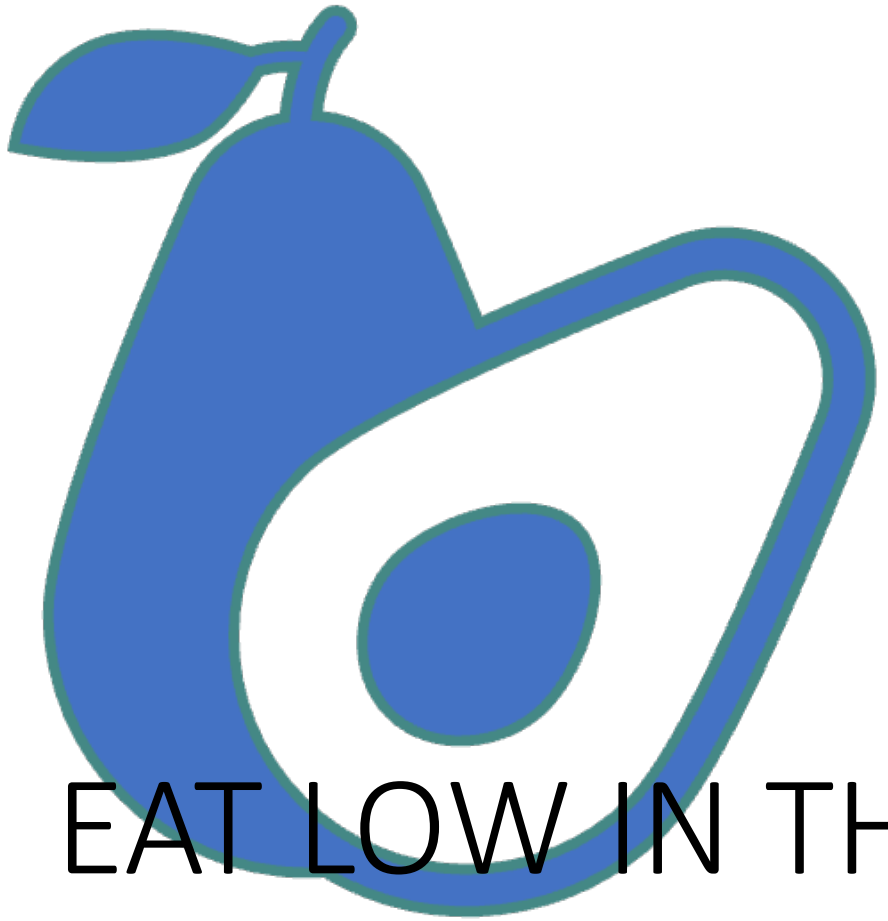
- The **10% Rule** means that when energy is passed in an **ecosystem** from one trophic level to the next, only **ten percent** of the energy will be passed on.

"Rule of 10"

Only ~10% passes to next level.
Therefore, ~90% LOSS at each trophic level



WHAT IS THE RELEVANCE OF THE 10% RULE?

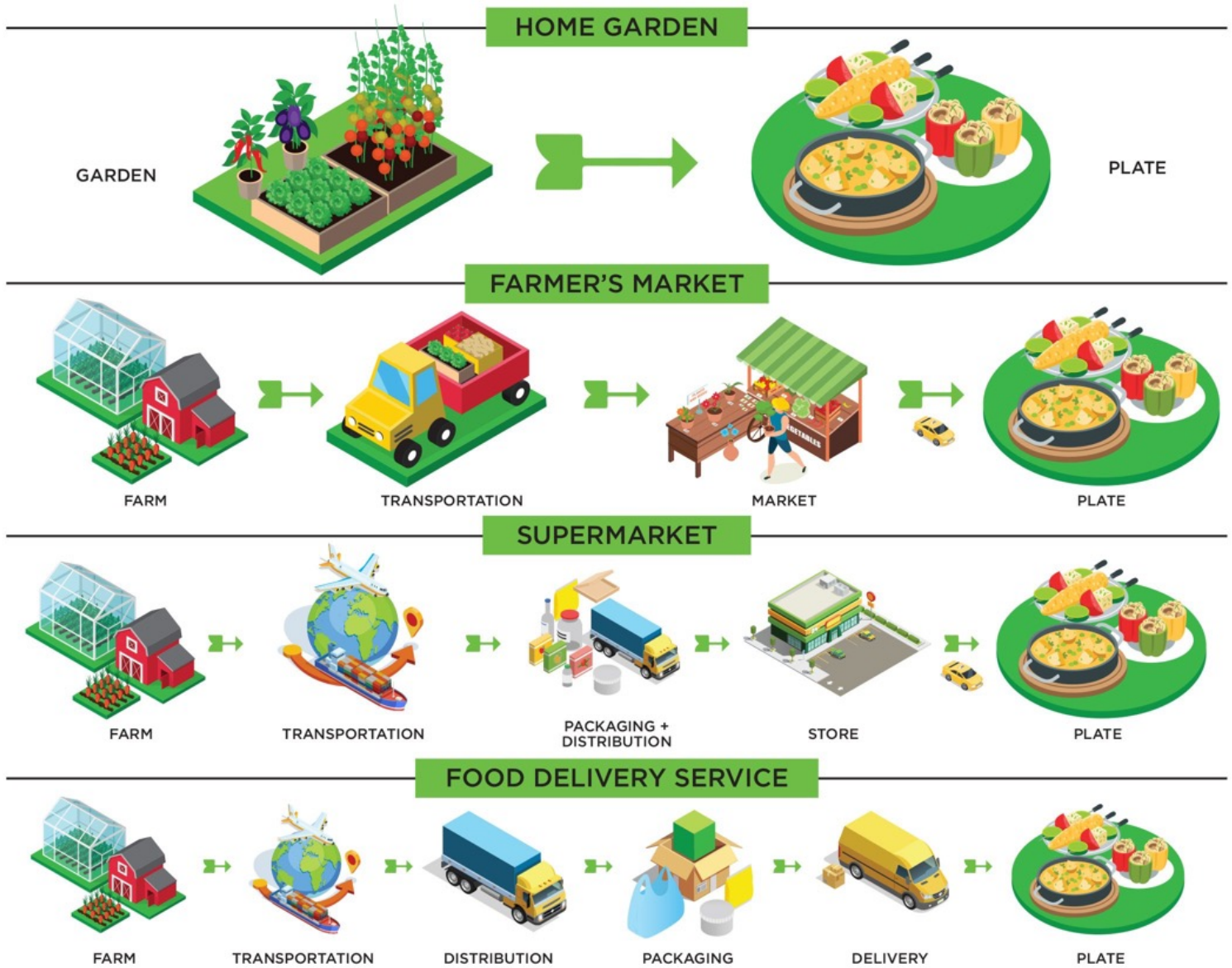


EAT LOW IN THE FOOD CHAIN

- How much resources is needed to grow corn for consumption versus growing cattle for consumption?
- Remember, 90% of energy is loss at each trophic level.

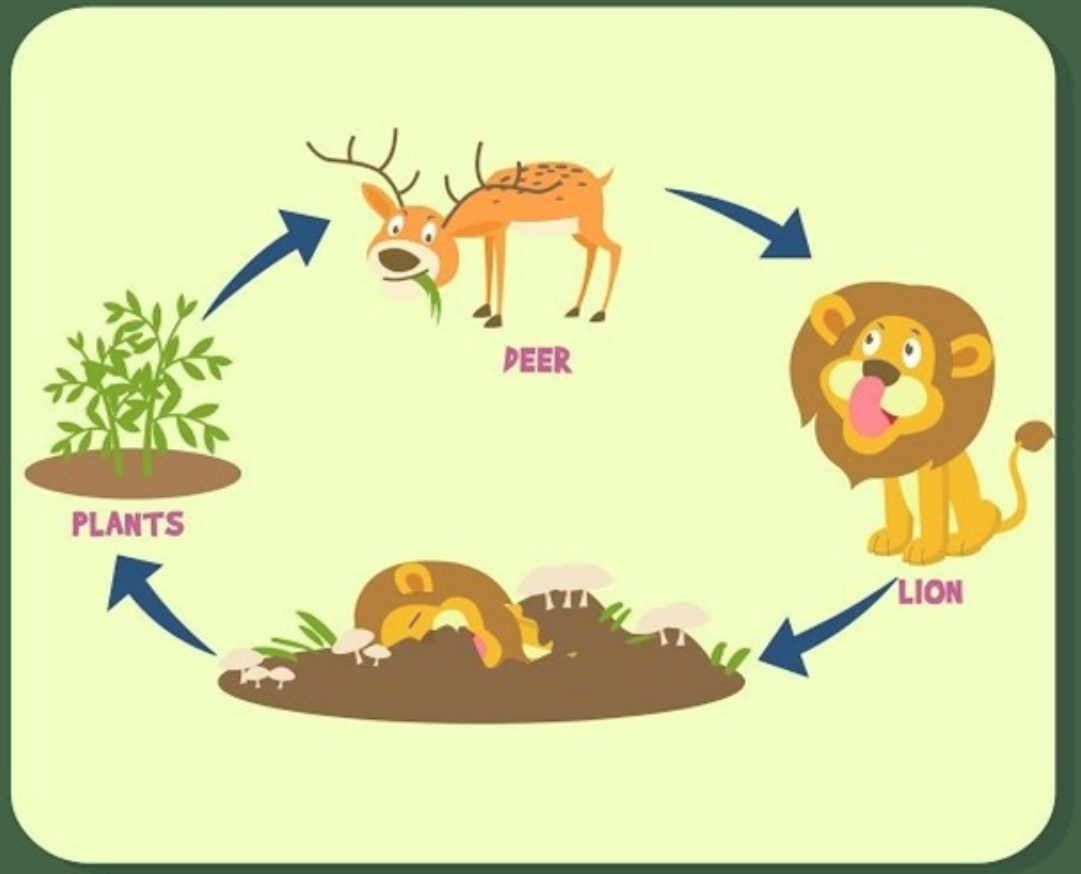
The Food Supply Chain

SHORTEN YOUR FOOD CHAIN

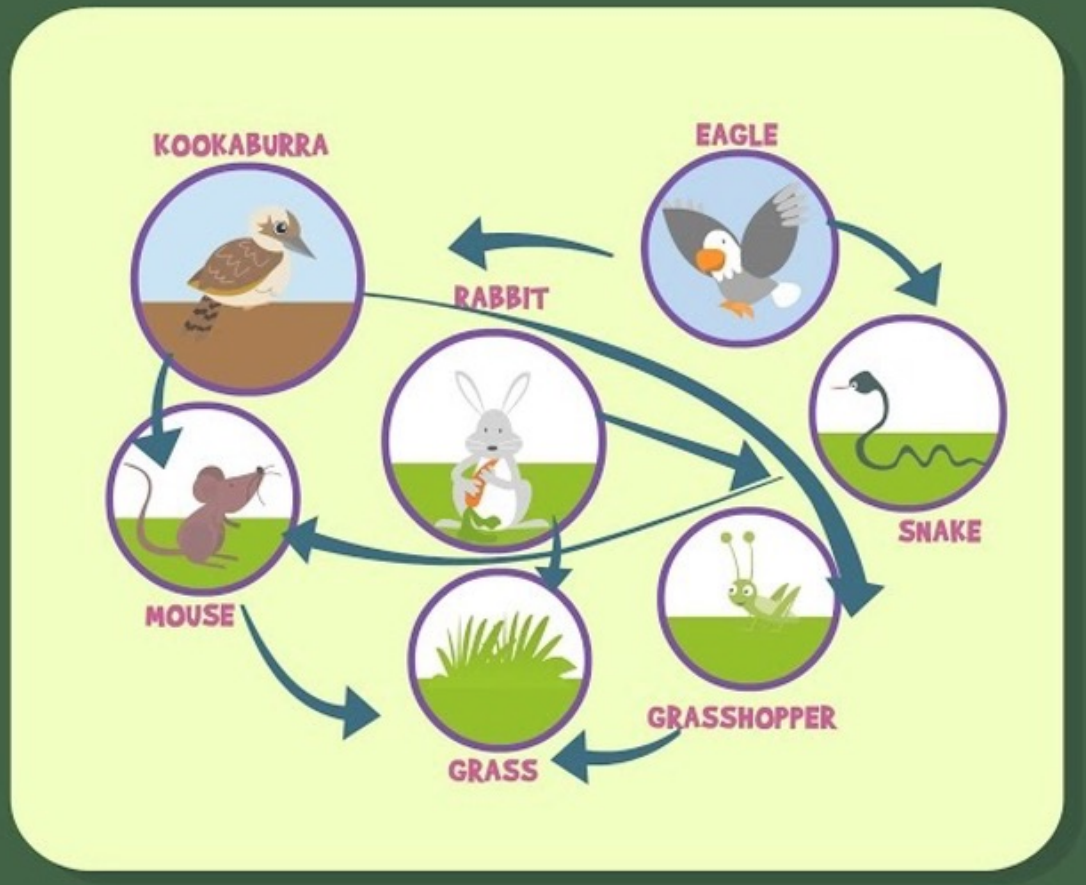


GROW YOUR OWN: SANDIASEED.COM

FOOD CHAIN

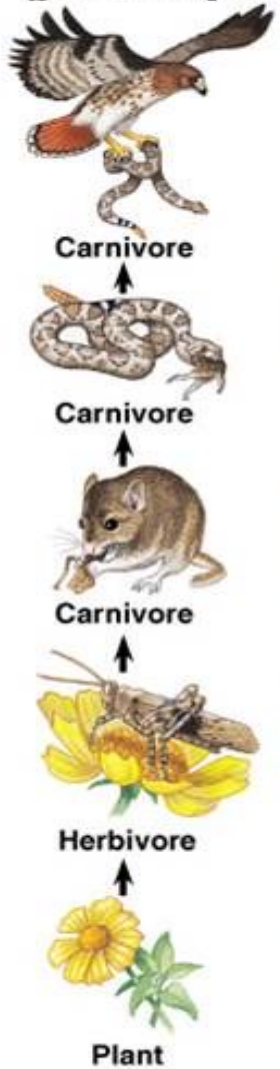


FOOD WEB



Food Chain

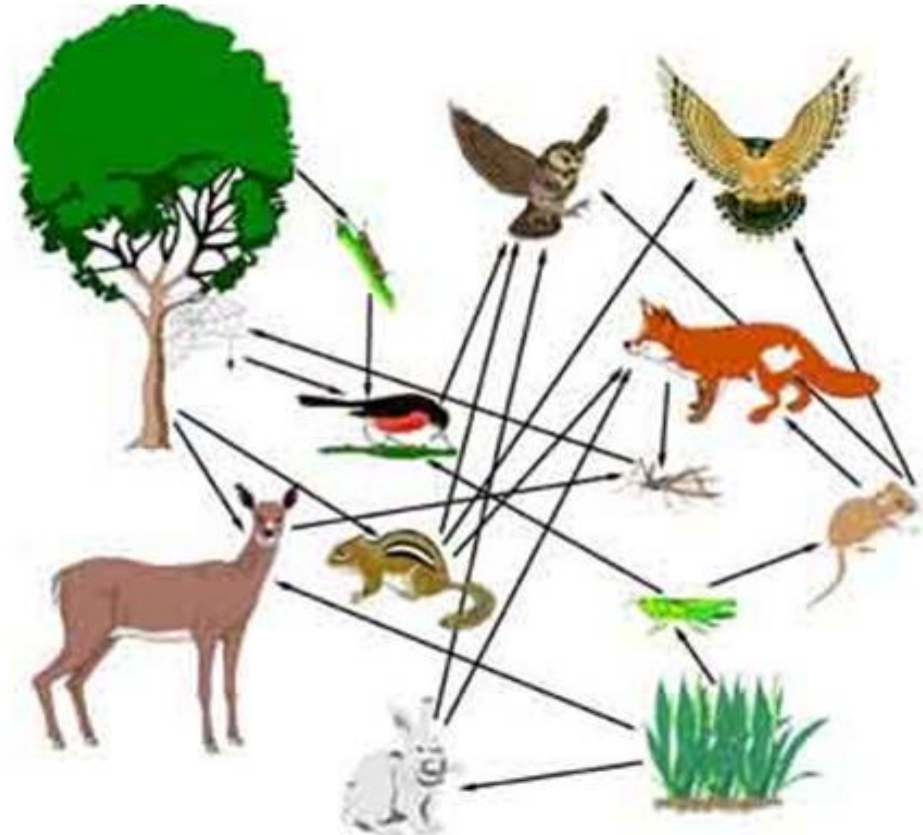
(just 1 path of energy)



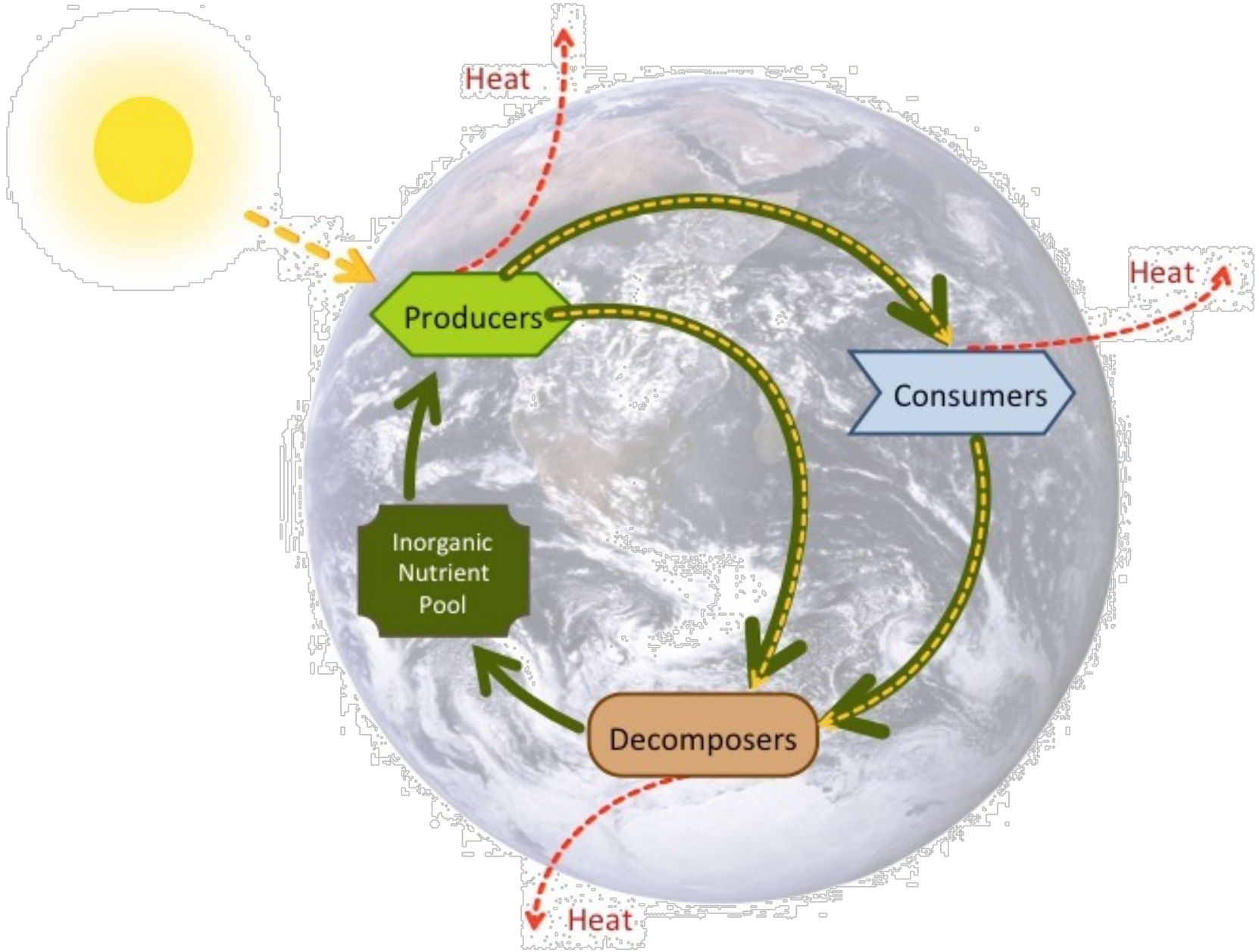
Quaternary consumers	5th trophic level
Tertiary consumers	4th trophic level
Secondary consumers	3rd trophic level
Primary consumers	2nd trophic level
Primary producers	1st trophic level

Food Web

(all possible energy paths)



The *arrow* points to the eater and shows the transfer of energy.


Heat
Producers
Heat
Consumers
Inorganic
Nutrient
Pool
Decomposers
Heat