

1.4.6 + 1.4.10.H Pyramid of Numbers

Use of Pyramid of Numbers

Ecological pyramids are used to compare different communities of the ecosystem by comparing trophic levels.

They attempt to discover and show the energy structure of an ecosystem as a chart by counting the number of individuals at each trophic level.

In general:

The number of organisms declines as you go up the pyramid

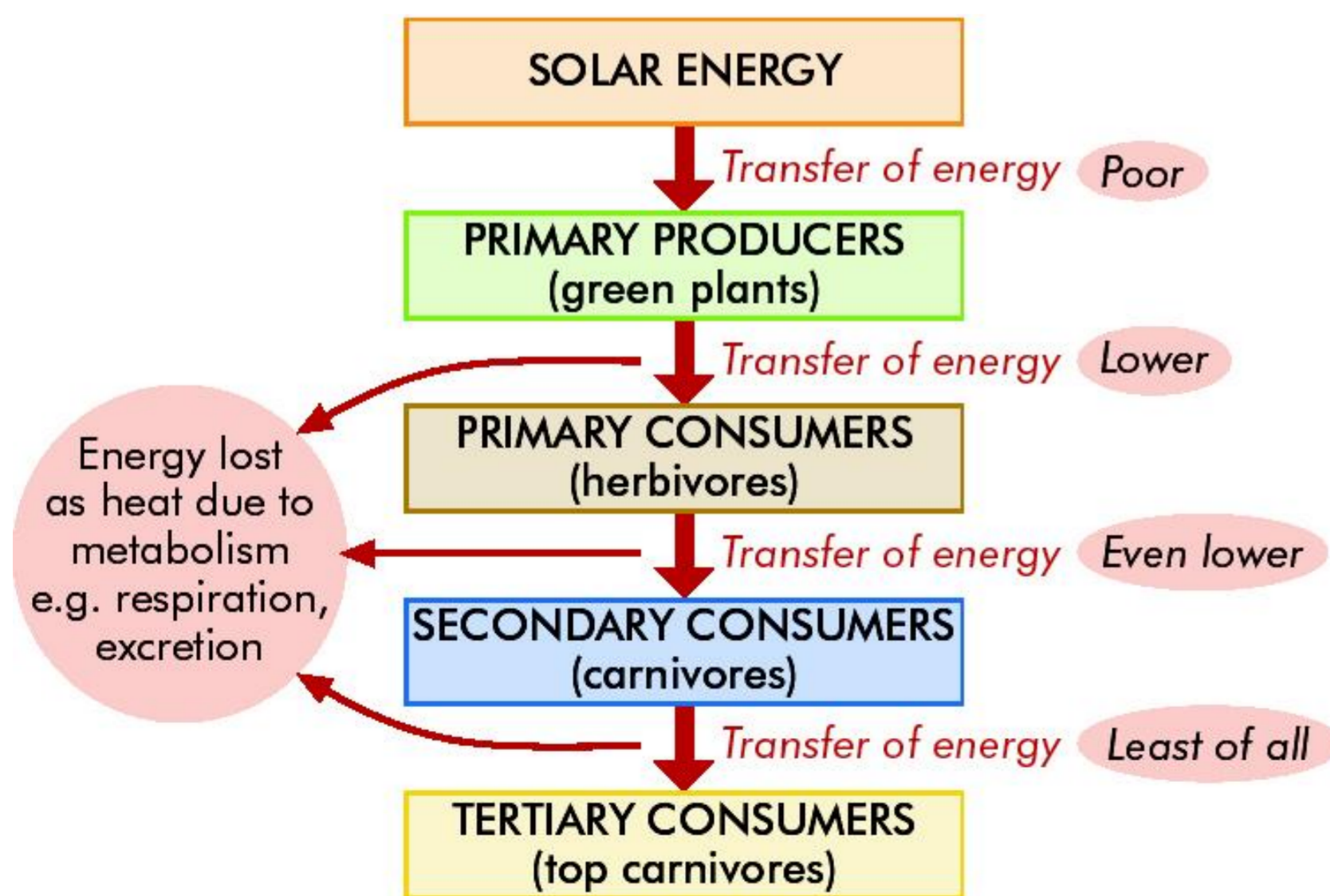
This is due to the large energy loss (about 90%) between each trophic level

As a result there is less energy available to organisms higher up the pyramid

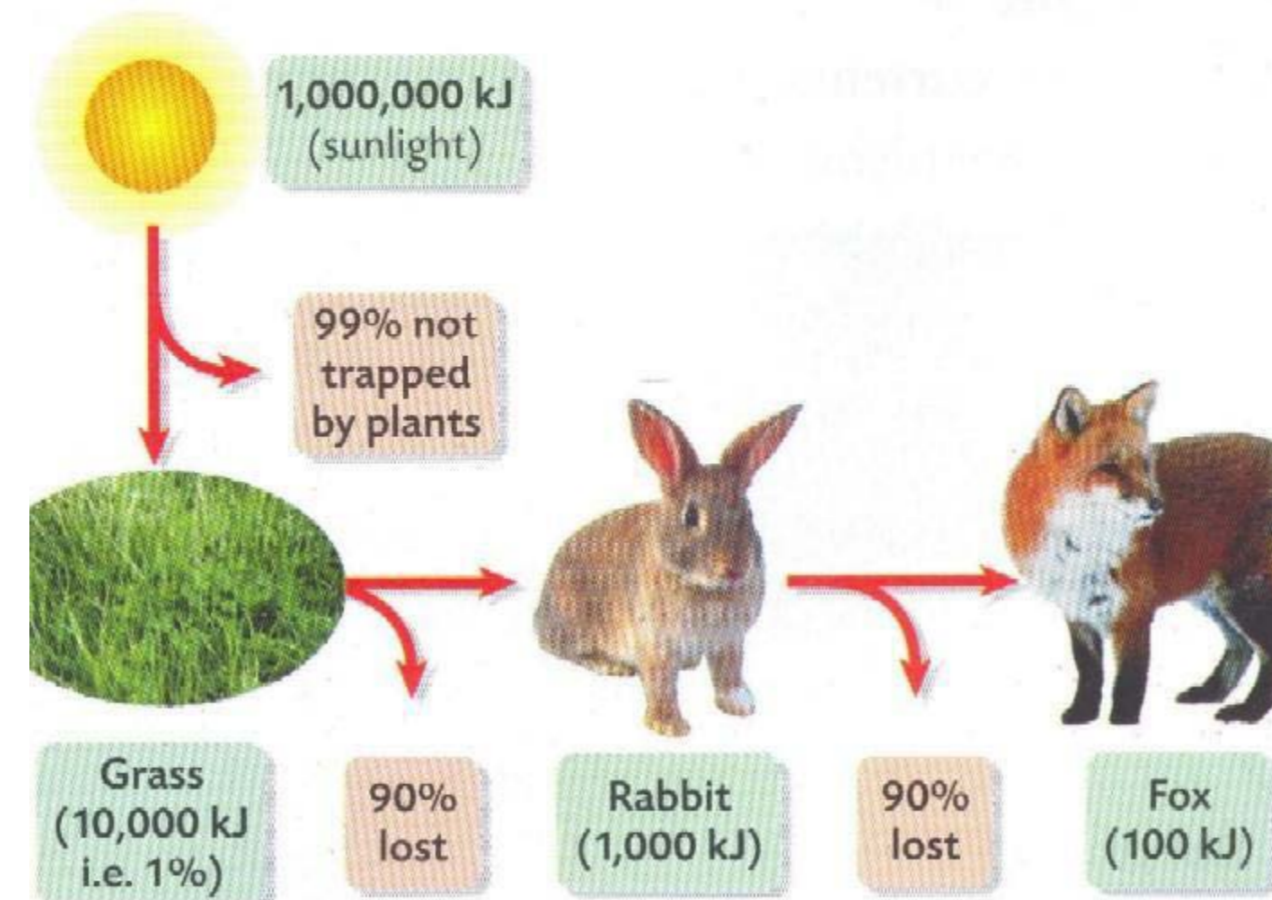
Loss of energy and body size increase as you go up the pyramid

Energy Transfer

This is the flow of energy *into the ecosystem* from the sun; and *within the ecosystem* through the different trophic levels along food chains, and finally *out of the ecosystem* into the atmosphere as heat loss due to respiration.



Energy loss in a Food Chain or Ecosystem

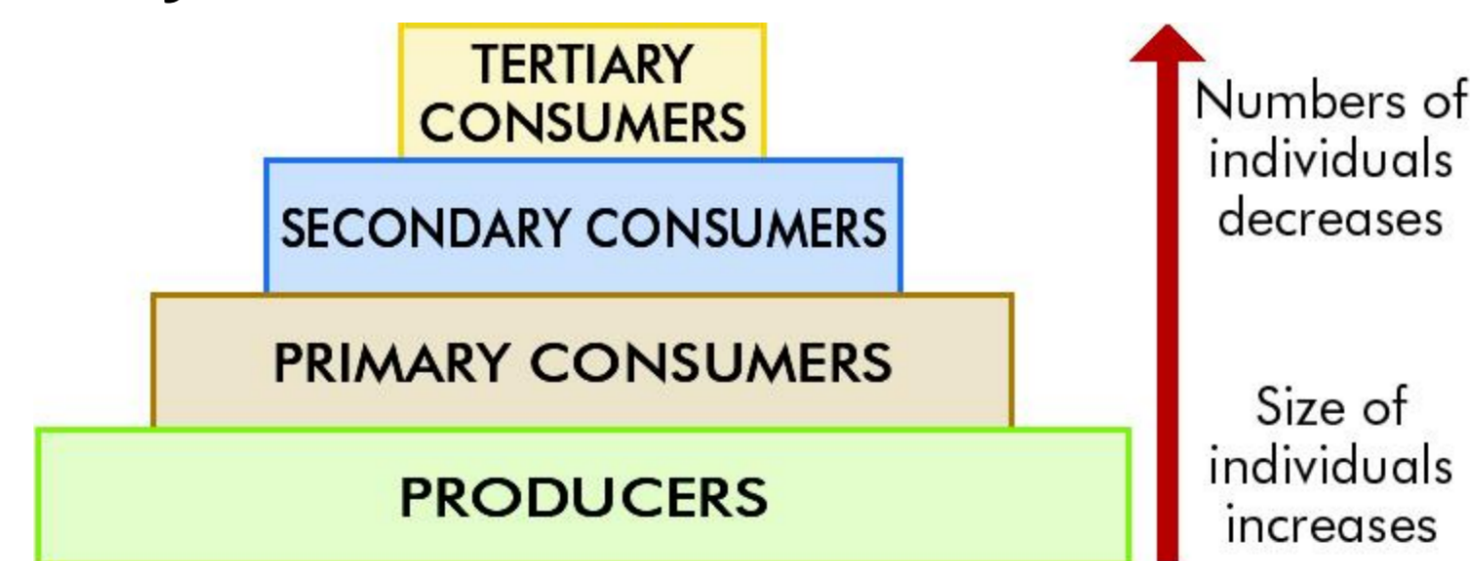


From the diagram above we can see that only about 10% of the energy in an organism is transferred when one member of a food chain is eaten by the next

The large energy loss from one trophic level to the next explains why food chains contain no more than four or five levels

Each trophic level contains less energy than the previous one

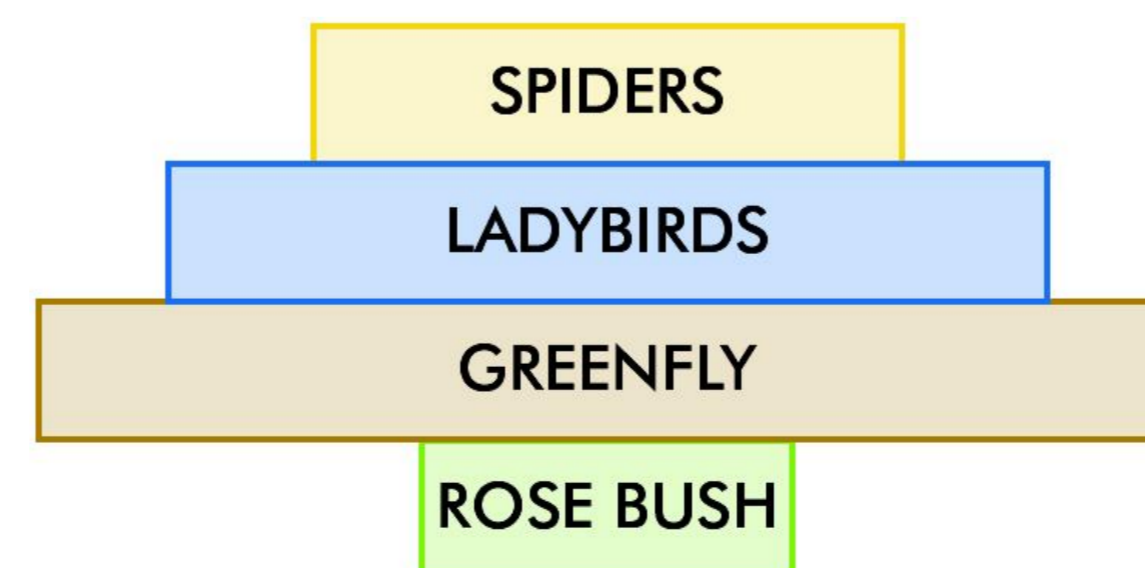
Normal Pyramid of Numbers



Limitations of use

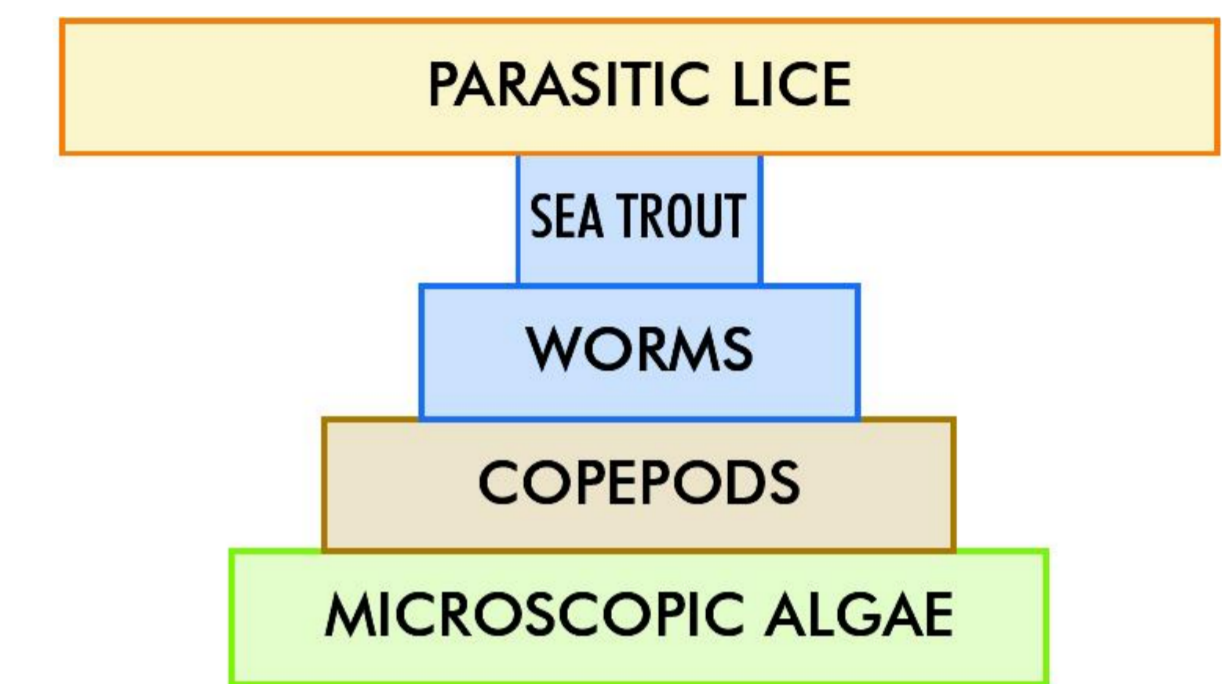
The size of organisms is not considered in a pyramid of numbers.

e.g. one rose bush can support thousands of greenfly.



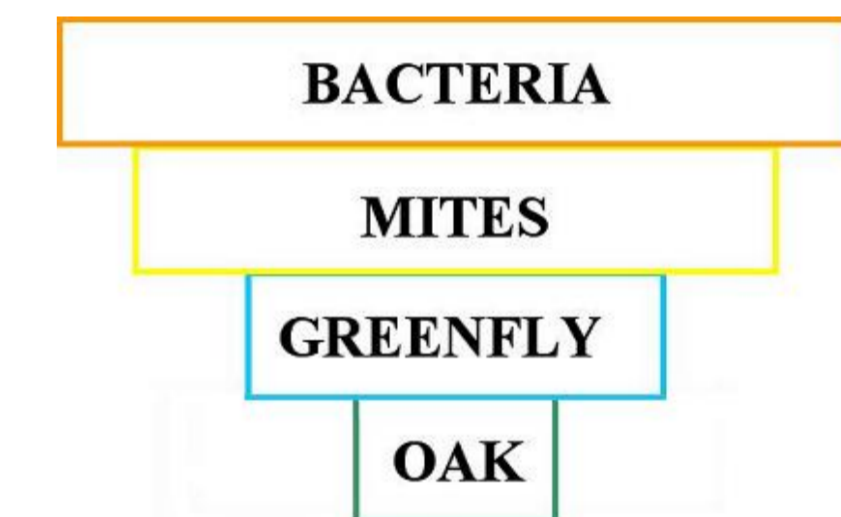
A distorted Pyramid of Numbers

A similar problem arises with parasites – numerous parasites on one host – resulting in a distorted pyramid



An inverted Pyramid of Numbers

When organism size is not considered very unusual pyramid shapes are likely to occur.



Another example

