ENERGY TRANSFER WITHIN ECOSYSTEMS

FOOD = ENERGY

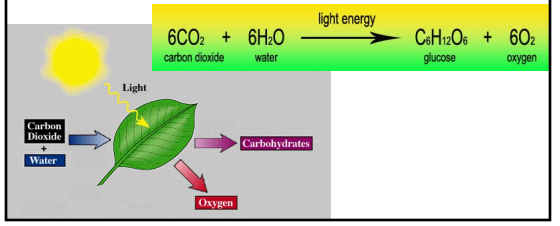
All living organisms require energy

Ecosystems include organisms that meet their energy needs in a variety of ways:

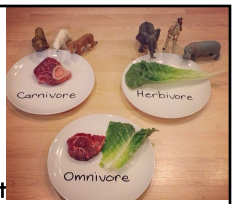
- Producers
- Consumers
- Decomposers

PRODUCERS (AKA AUTOTROPHS)

Make their own food with energy from Sun (photosynthesis) or with chemicals (chemosynthesis)



CONSUMERS



Eat other organisms

Four Types:

- Herbivores—eat only plant
- Carnivores—eat only other consumers (animals)
- Omnivores—eat both plants and consumers
- Scavengers—eat only DEAD consumers

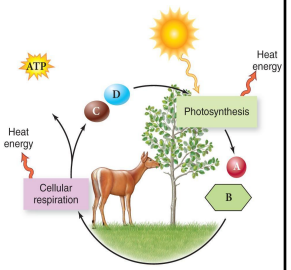
NAME THAT CONSUMER TYPE!!!

DECOMPOSERS

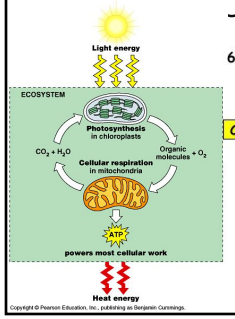
Break down dead organic matter into nutrients

HOW DO ORGANISMS GET ENERGY FROM FOOD?

Cellular respiration breaks down food molecules, making stored energy available to the cell



PHOTOSYNTHESIS VS. RESPIRATION



photosynthesis

$6CO_2 + 6H_2O + \text{energy} \rightarrow C_6H_{12}O_6 + 6O_2$

energy in

aerobic respiration

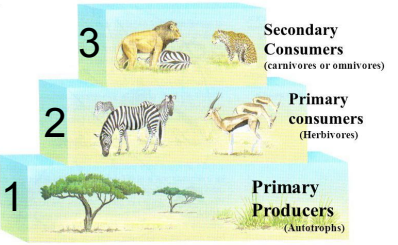
$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{energy}$

energy out

Inputs of **photosynthesis** are ***outputs*** to **respiration** and vice versa

TROPHIC LEVELS

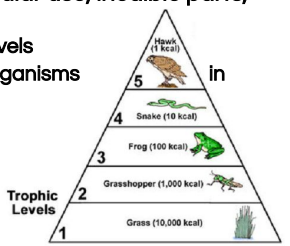
Position an organism occupies in a food chain



TROPHIC LEVELS

~90% LOSS of energy from one level to the next (heat, cellular use, inedible parts, etc.)

- Limits number of levels
- Limits number of organisms in each level

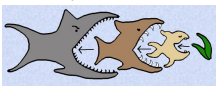


FOOD CHAINS VS. FOOD WEBS

Food Chains

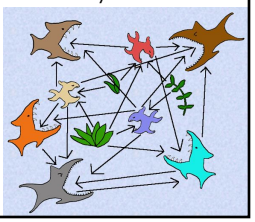
Series of organisms transferring energy between trophic levels

Example:



Food Webs

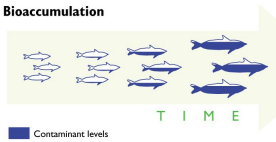
All the food chains in one ecosystem



TROPHIC LEVELS AND POLLUTANTS

Bioaccumulation

Absorption and retention of an environmental pollutant in one organism throughout



Biomagnification

The absorption, retention, & movement of a pollutant through trophic levels

Higher trophic levels are more affected