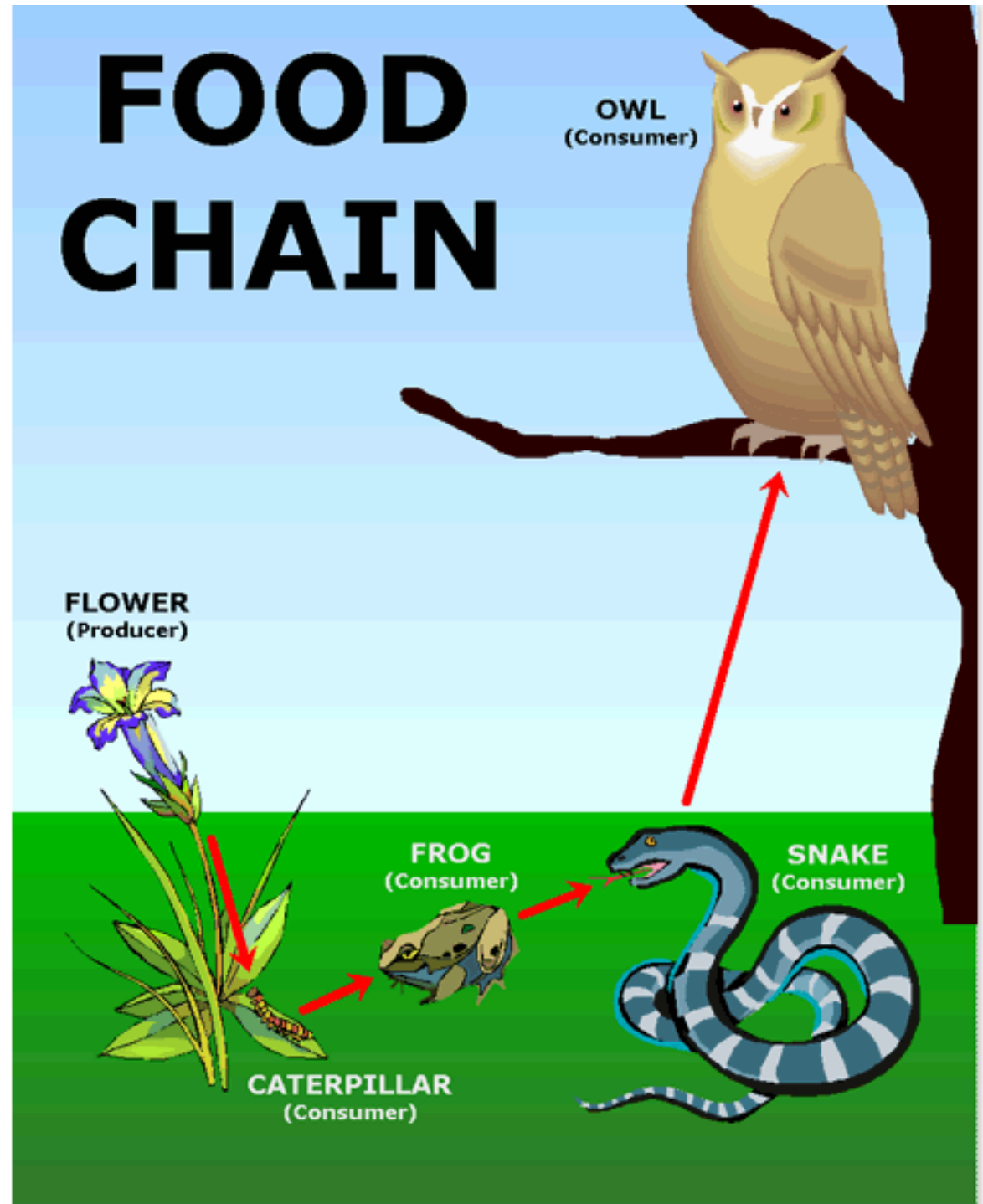




Food Webs

Food chains and food webs are used to describe the feeding relationships between species in a community.

Food chains show the transfer of nutrients and energy from one species to another within an ecosystem.



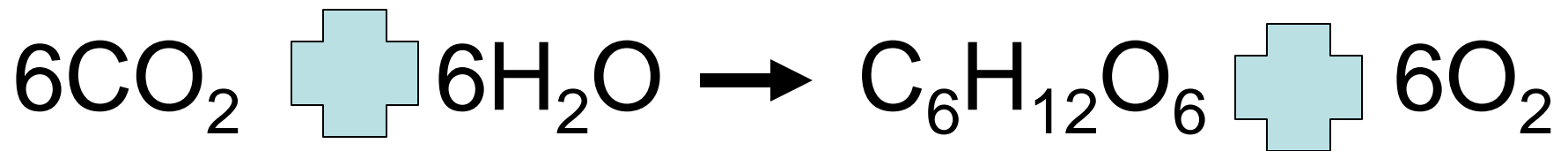
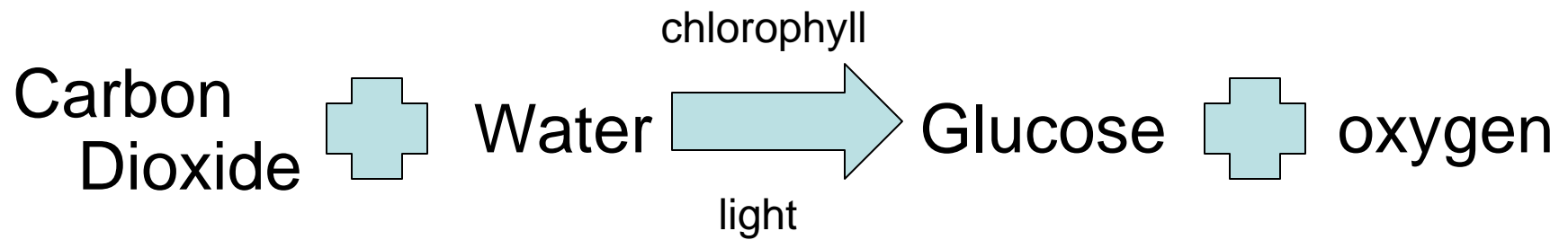
Trophic Levels

- Organisms are grouped into trophic levels (from the Greek for nourishment, trophikos) based on how many links they are removed from the primary producers.
- Primary producers, or autotrophs, are species capable of producing organic molecules (sugars) from an energy source and inorganic materials.
- These organisms are typically photosynthetic plants, bacteria or algae, but in rare cases, like those organisms forming the base of deep-sea vent food webs, can be chemotrophic.
- All organisms that eat the autotrophs are called heterotrophs. They get their energy by eating the producers.

What are the roles in an ecosystem ?

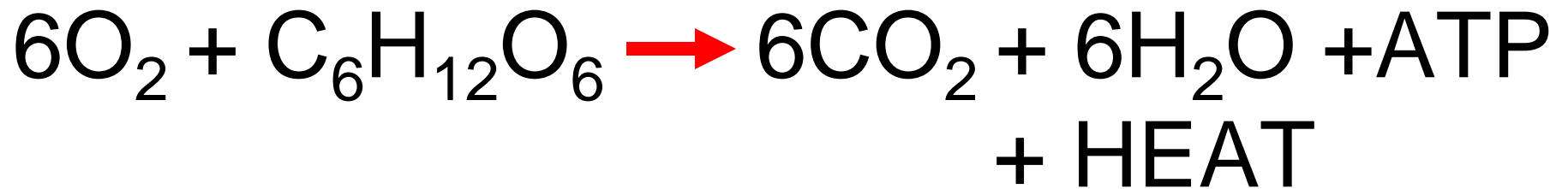
- Two main roles: Producers and Consumers
 1. Producers/ Autotrophs: makes their own food by converting one form of energy into an organic form. Basis of food chains
 - a. Chemotrophs: using chemical energy such as hydrogen sulfide or methane as an energy source. Ex: archaeobacteria
 - b. Phototrophs: using light energy to create organic sugars as an energy source. Contain chlorophyll and usually other light sensitive pigments (carotenoids)

What's the formula for photosynthesis???



How does an organism use the energy in glucose ?

- Cellular Respiration: the process used by all organisms to convert the energy in glucose and other sugars into a usable energy form



If photosynthesis is making glucose then cellular respiration is using it.

Photosynthetic Food Chain

SUN

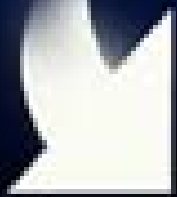


Chloroplasts
LIGHT Energy



Reduced
Carbon
Compounds

GREEN
PLANT



Herbivores



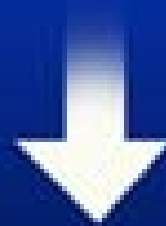
Carnivores

Chemosynthetic Food Chain

Carnivores



Bacteria
SULFIDE Energy



Reduced
Carbon
Compounds

SULFIDE

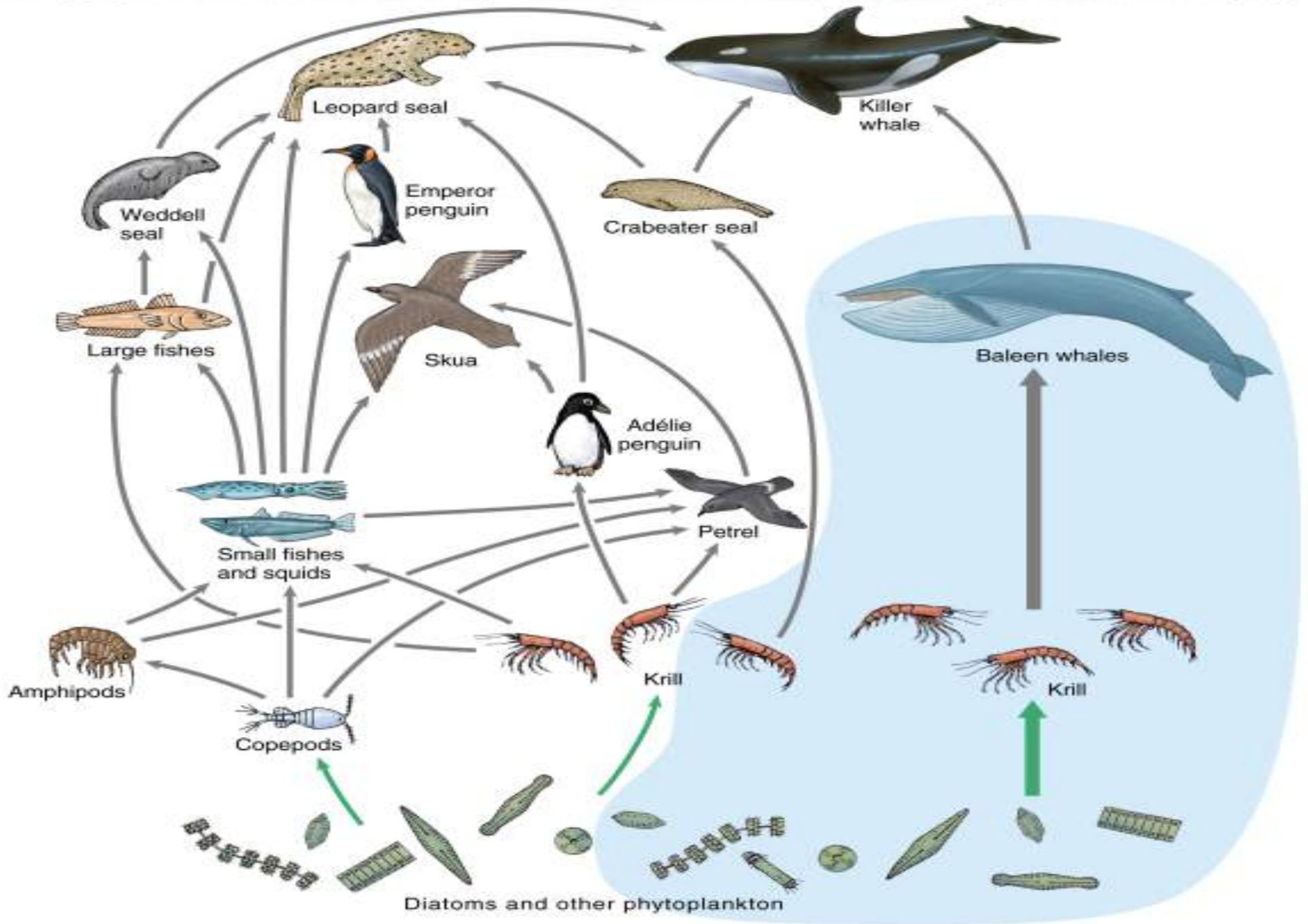


Hydrothermal
Vent



Consumers

- Consumers/ Heterotrophs: organisms that do not make their own food
- Variety of Roles
 1. Decomposer: recycle nutrients like nitrogen and phosphorus locked up in organic matter like dead organisms and poop. Ex: bacteria
 2. Herbivores: feed on producers. Ex: Manatee, many zooplankton, many gastropods
 3. Carnivores: eat other consumers
 4. Saprophytes: eat dead organic matter. Help clean up ecosystems. Ex: crabs and mud snails



Laws of Thermodynamics

Conservation of Matter

In any physical or chemical change, matter is neither created nor destroyed, but merely changes from one form to another

Conservation of Energy

In any physical or chemical change, energy is neither created nor destroyed, but merely changes from one form to another

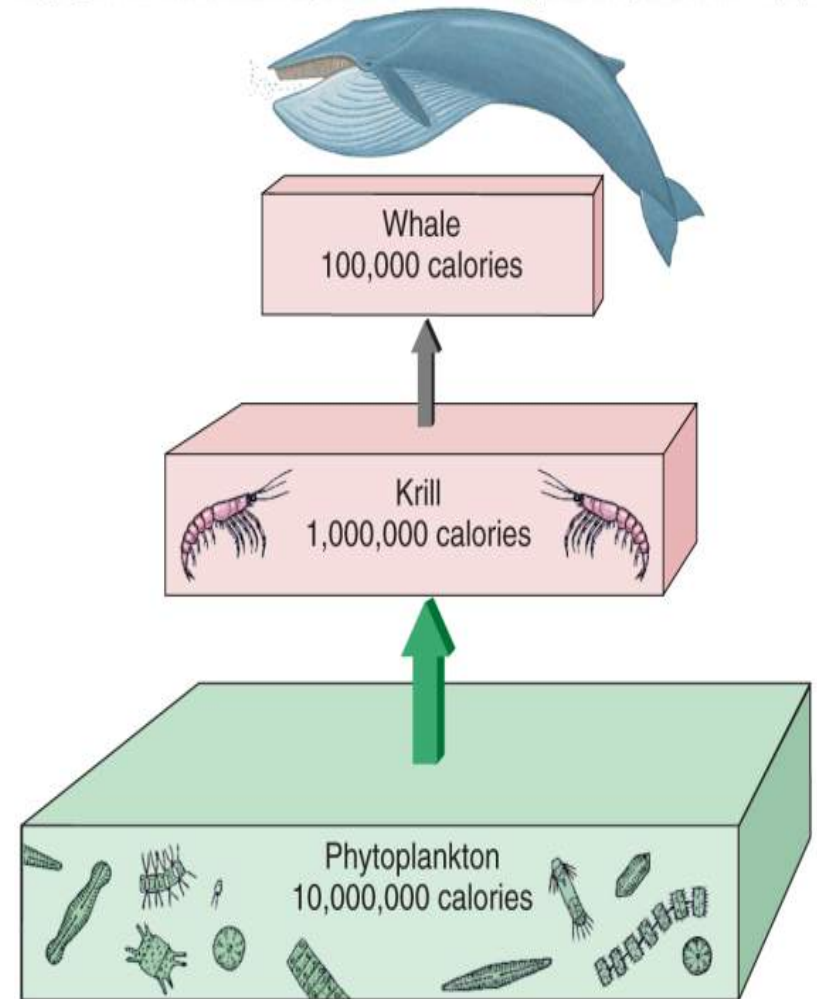
Law of Energy Degradation (entropy)

Energy moves from an organized, useful form to a disorganized less useful form. Energy can not be completely recycled to its original state of organized, high quality usefulness.

Flow of Energy

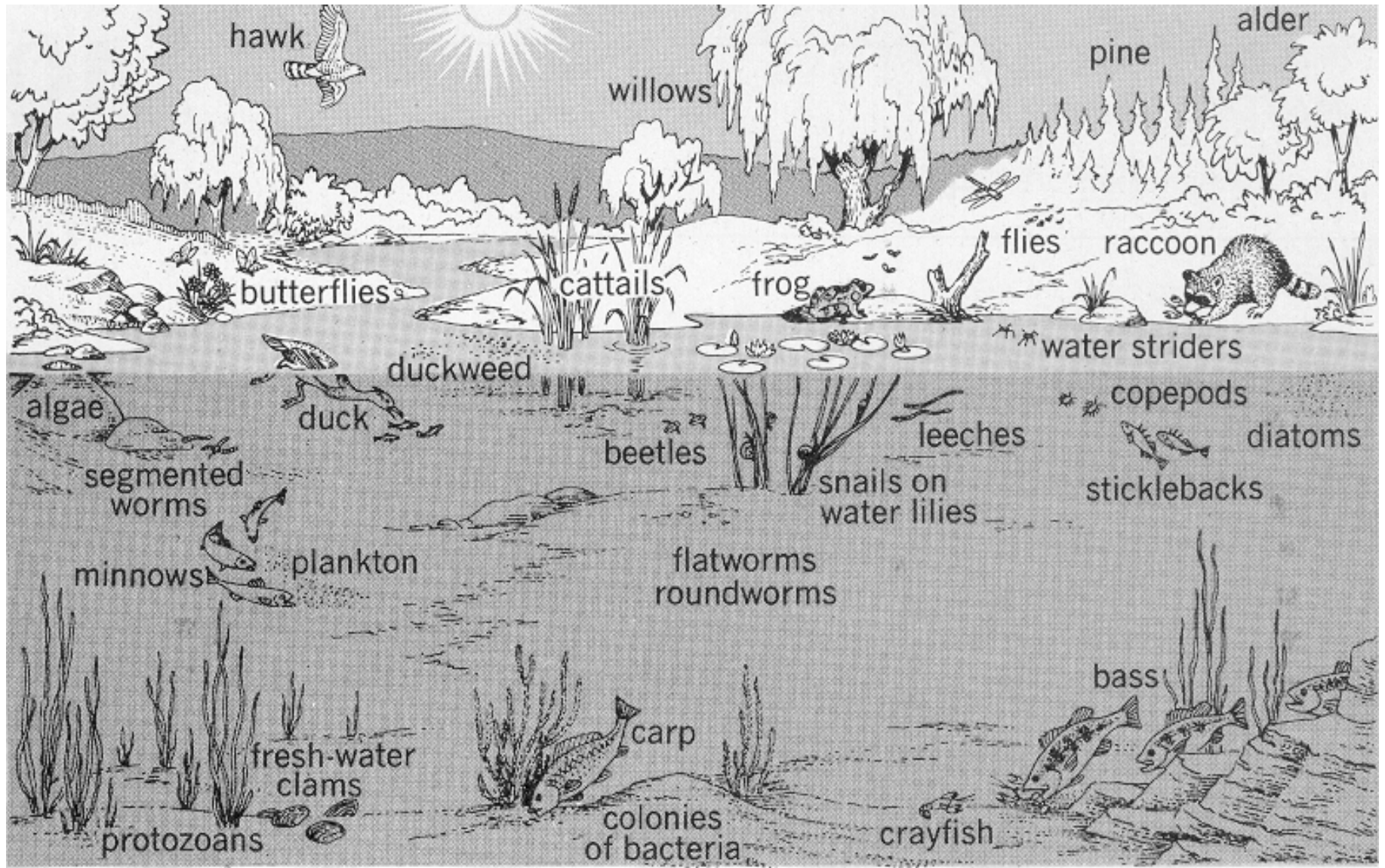
- Only 10% of the energy is passed from one trophic level to the next
- Energy is lost mostly as heat
- Energy cannot be recycled

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(a)

Pond Ecosystem



What chain is most efficient?

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