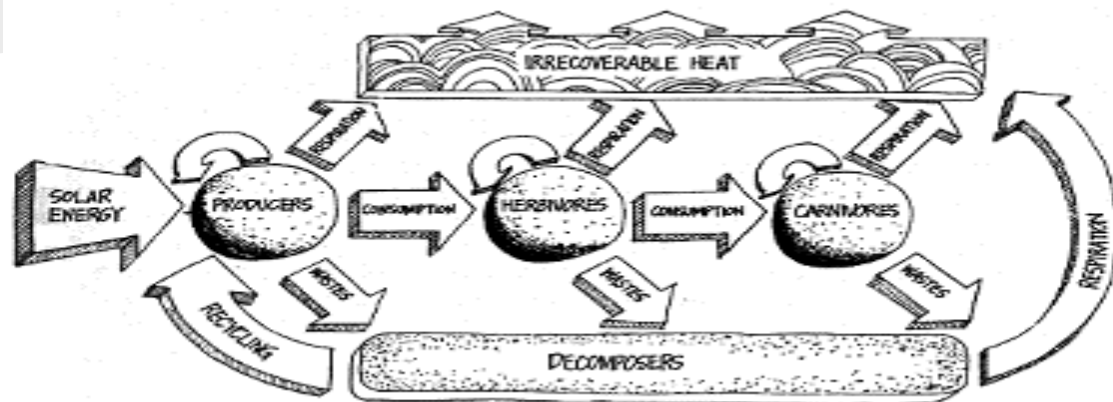


Energy, Producers and Consumers



Learning Targets

- 1) Classify community members as producers or type of consumers.
- 2) Explain how energy flows through an ecosystem.
- 3) Interpret a food chain or web.
- 4) Calculate the flow of energy from one trophic level to another.

What are primary producers?

- Living systems operate by expending energy.
 - organisms need energy for:
 - growth
 - reproduction
 - metabolic processes
- No organism can create energy!

What are primary producers?

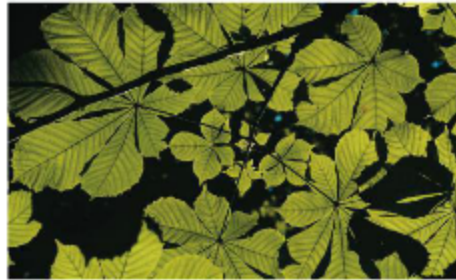
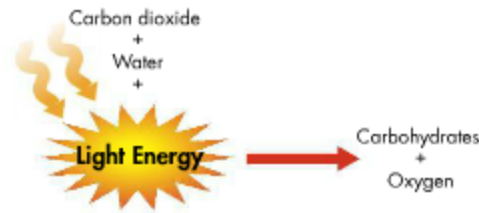
- For most organisms the sun is the ultimate source of energy.
 - For some organisms, chemical energy is stored in inorganic chemical compounds can serve as the ultimate energy source.

What are primary producers?

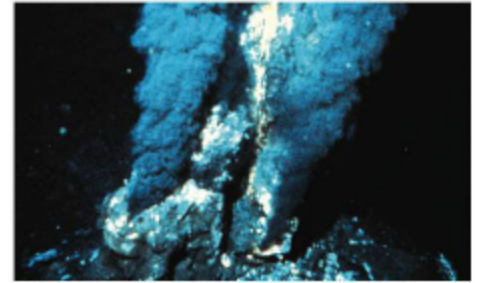
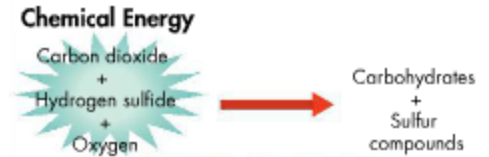
- Only algae, certain bacteria, and plants can capture energy from sunlight or chemicals and convert it into a usable form.
 - These organisms are called **autotrophs**
 - Autotrophs store energy in forms that make it available to other organisms that eat them.

What are primary producers?

- Primary producers are the first producers of energy-rich compounds that are later used by other organisms.
 - photosynthesis
 - chemosynthesis



Photosynthesis



Chemosynthesis

How do consumers obtain energy and nutrients?

- Unlike producers animals, fungi, and many bacteria cannot directly harness energy from their environment.
 - heterotrophs - must acquire energy
 - consumers

What are the different types of consumers?

- Carnivores
- Scavengers
- Herbivores
- Omnivores
- Decomposers
- Detritivores.

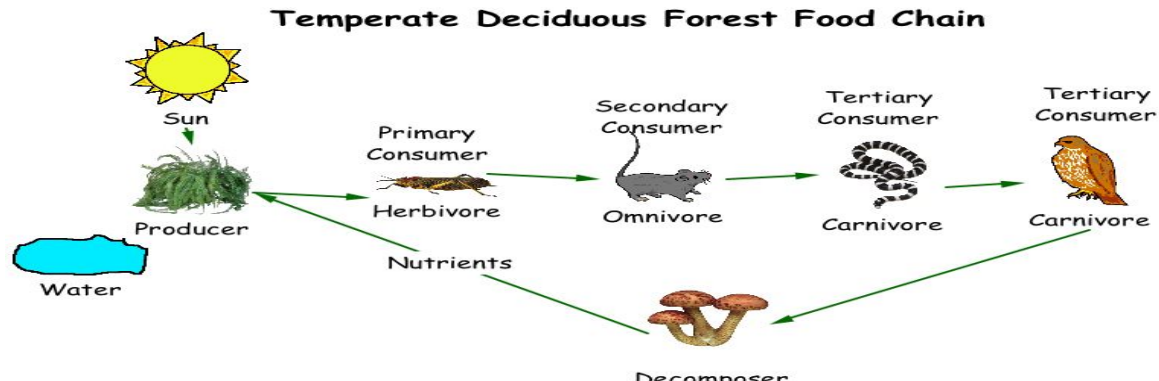
Can an organisms belong to more than one of these categories?

How does energy flow through ecosystems?

Energy flows through an ecosystem in a one-way stream, from primary producers to various consumers.

Food Chains

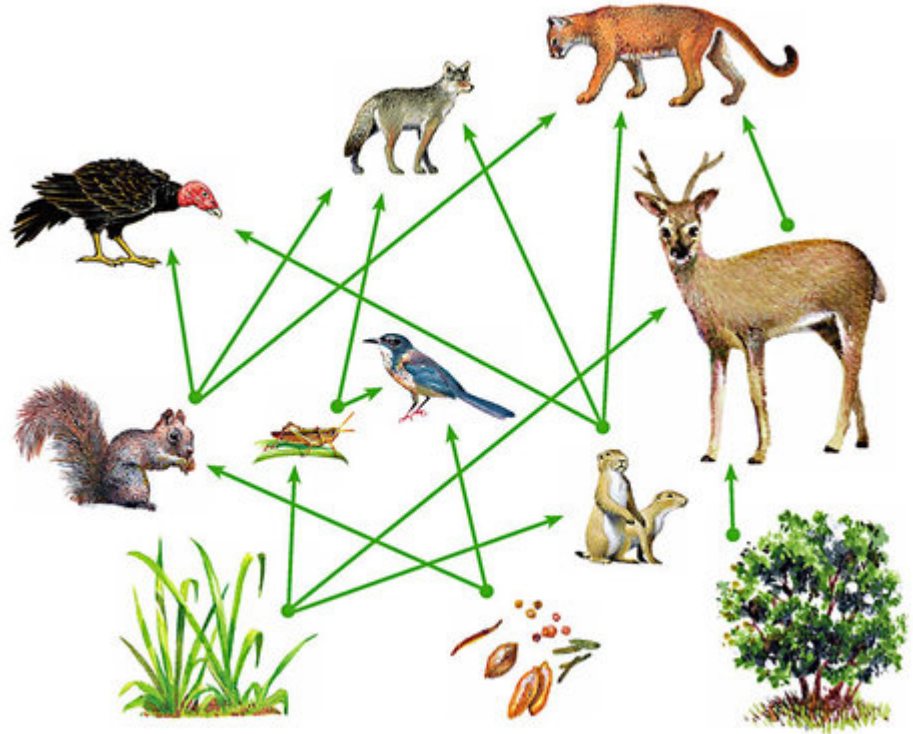
a series of steps in which organisms transfer energy by eating and being eaten.



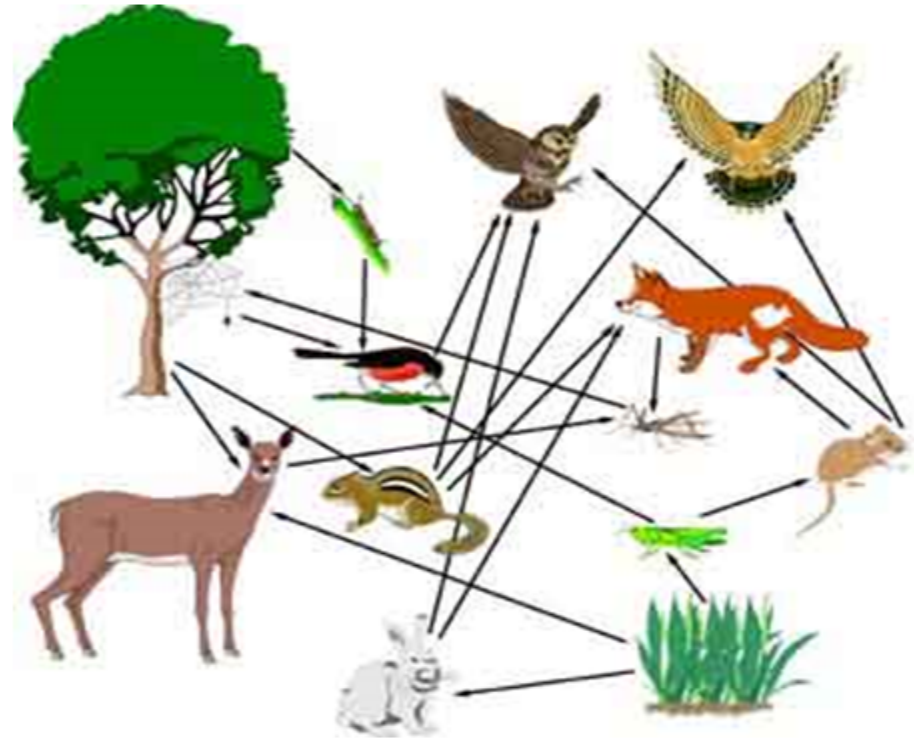
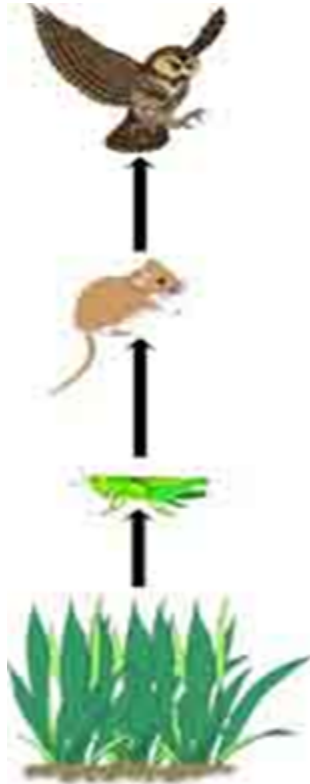
How does energy flow through ecosystems?

Food Webs

In most ecosystems, feeding relationships are much more complicated than the relationships described in a single, simple chain.



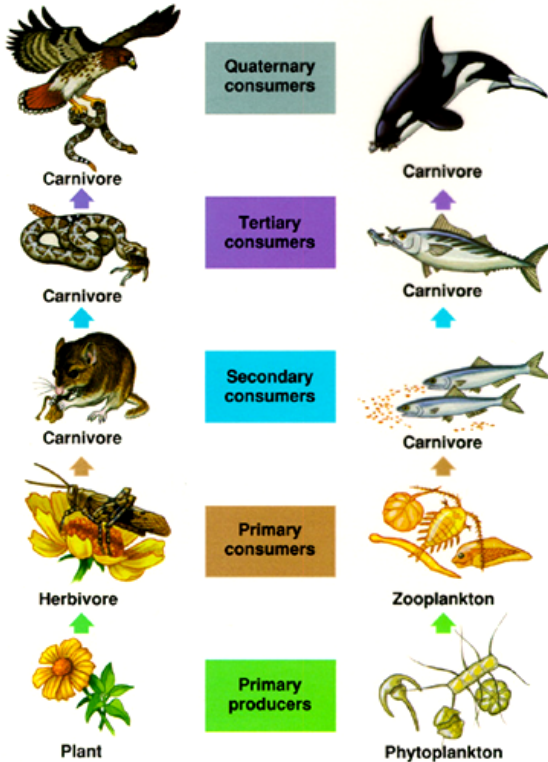
Food Chain vs. Food Web



How to Draw Food Webs

- Primary producers are positioned towards the bottom of the food web.
- Consumers are positioned towards the top of the food web.
- Arrows indicate a predator-prey relationship and the direction of energy flow.

What are trophic levels?

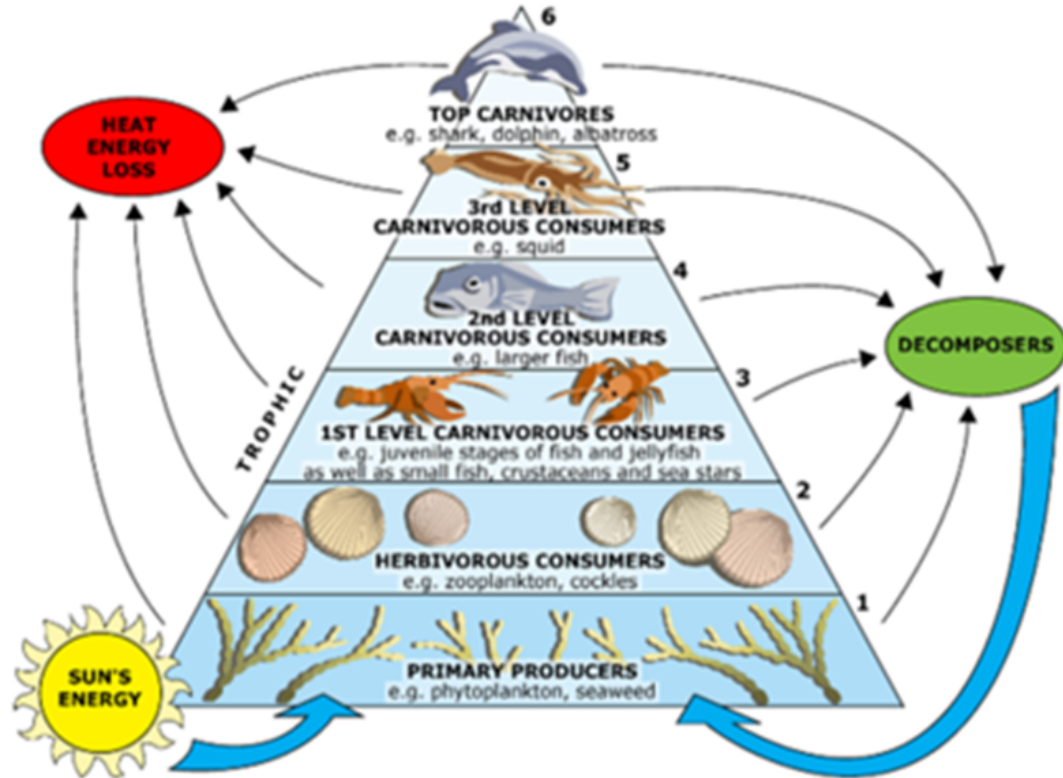


- **Trophic Level**: each step of a food chain or web.
 - 1st: Primary Producers
 - 2nd: Primary Consumers
 - 3rd: Secondary Consumers
 - 4th: Tertiary Consumers
- Each level is dependent on the one before it for energy.

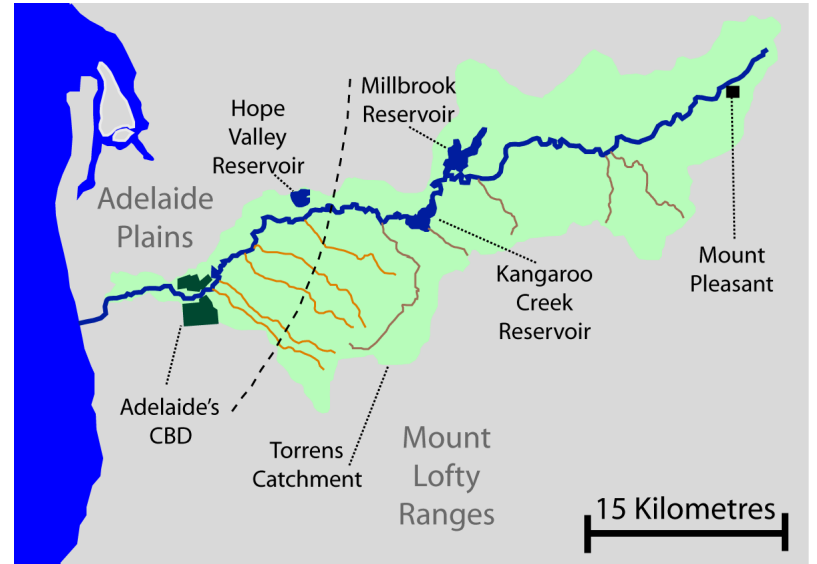
What is the 10% Rule?

- **Ten Percent Rule**: only 10% of the energy available within one trophic level is transferred to the next trophic level.
- Only applies to energy pyramids.
- Organisms use most of the energy for reproduction, respiration, and movement.
- Other energy is lost the form of heat or released to the environment somehow.

What is the 10% Rule?



Torrens River



Water Ribbons



Topped Reeds



Water boatman



Mosquito Larvae & Long Necked Tortoise



Yabbies



Pacific Black Ducks



Pelican and Black Swans



White-faced heron



Purple Swamp Hen



Blue-tongue Lizard



Torrens Wetland Food Web

Pages 69-78 in your textbook will help you with any unfamiliar vocabulary.