Wednesday, March 28, 2018

Pick up: none

Today you will:

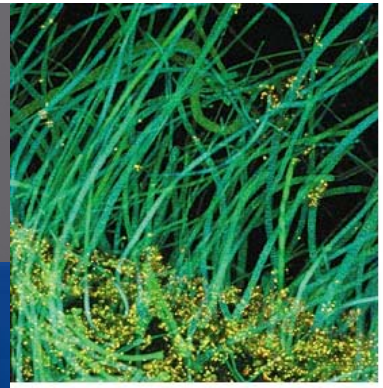
1. Finish notes on basic ecology and matter and energy
2. Complete food web activity

Homework/Planner:

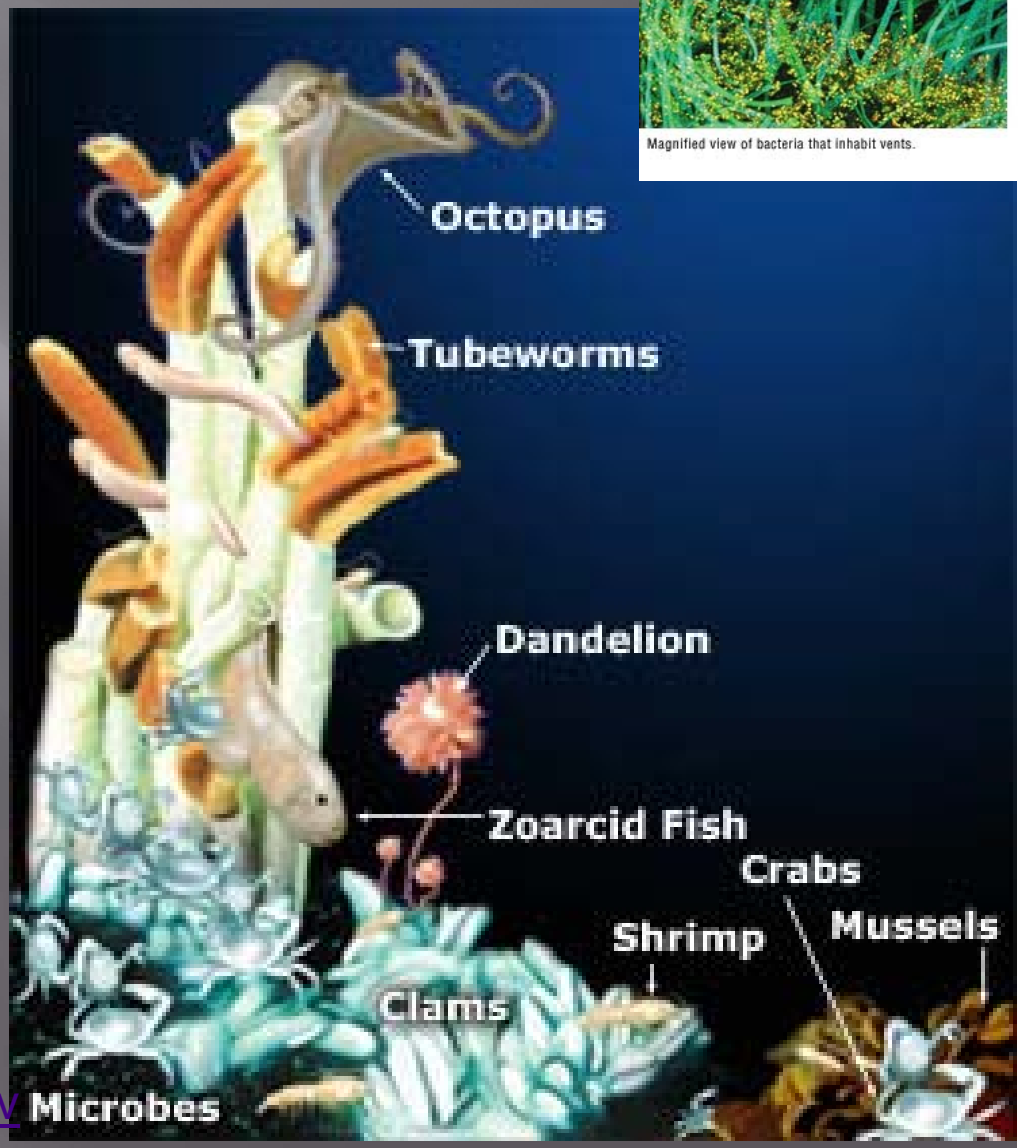
Food Web Activity due Friday

CHEMOSynthesis & HydroTHermal Vents

- Deep ocean
- Living things evolved in absence of sunlight
- All due to Bacteria that convert chemicals (hydrogen sulfide) to food for animals



Magnified view of bacteria that inhabit vents.



http://www.youtube.com/watch?v=D69hGvCsWgA&safety_mode=true&persist_safety

What is ecology?

- Study of the interactions between organisms & their environment

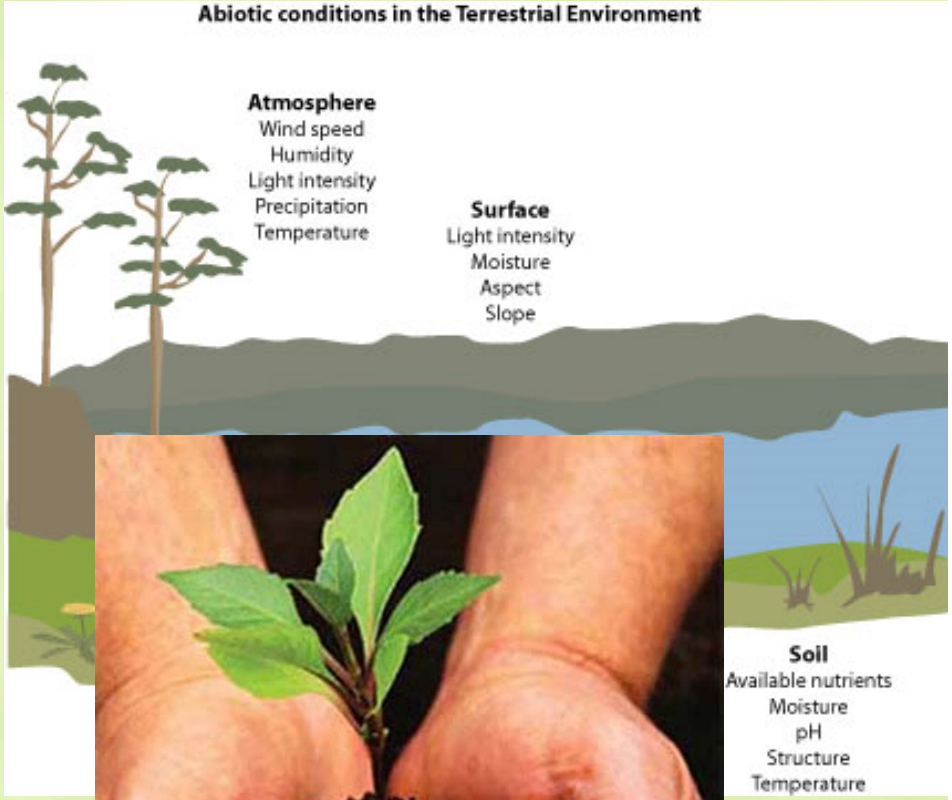
Origin of the word "ecology"

- Greek origin
- OIKOS = household
- LOGOS = study of…

- Study of the "house/environment" in which we live.

Ecology is study of interactions between

- **non-living components in the environment…**
  - light
  - water
  - wind
  - nutrients in soil
  - heat
  - solar radiation
  - atmosphere, etc.
- AND…
- **Living organisms…**
  - Plants
  - Animals
  - microorganisms in soil, etc.



•Biotic vs. Abiotic Factors = *Limiting Factors*

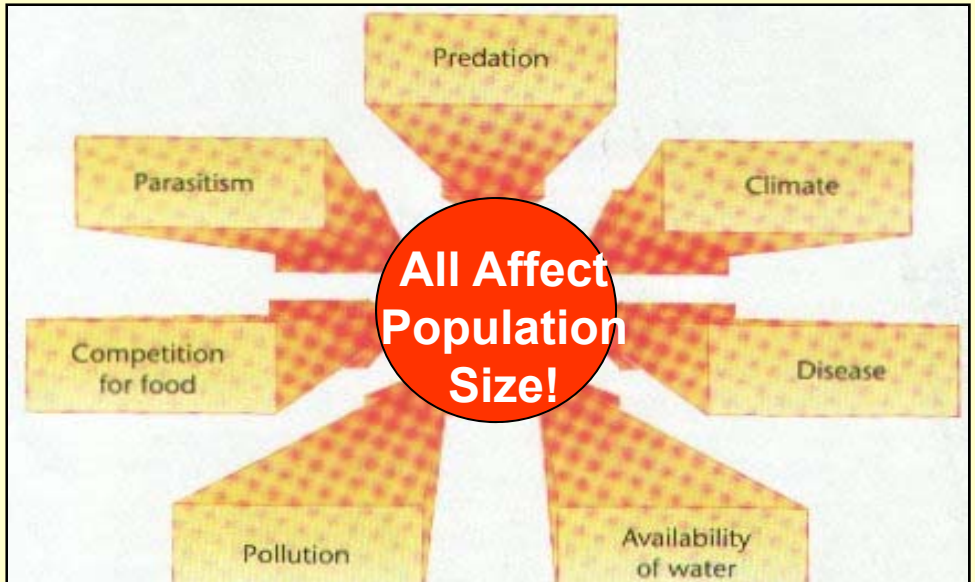
•All the **<u>living</u> things** that affect an organism.

- •<u>Ex:</u> Producers, Consumers, & Decomposers

•Include **<u>nonliving</u> things** that affect an organism.

- •<u>Ex:</u> temperature, sunlight, pH, water, soil type, topography... *They limit the kinds of organisms that live in an environment.*

BOTH limit the kinds of organisms that live in an environment.



Make a Venn Diagram in your Notebook

Biotic vs. Abiotic

•Whale	•Clouds	•Finger Nails
•Clock	•Corpse	•Pipe
•Water	•Snail	•Cotton Fabric
•Fish	•Steak	•Wool
•Paper	•Pork Chops	•Gold
•Glass	•Salad	•Plastic
•Aluminum	•Bread	•Grapes
•Wooden Ruler	•Plant	•Air
•Sand	•Hair	•Virus

- **ABIOTIC** is something that has never lived
- **BIOTIC** is something that is living or was once living:
  - *The 6 characteristics that living things have in common: growth, reproduction, respiration, complex chemical reactions, cells, and movement.*

BIOTIC

1. Whale
2. Fish
3. Paper
4. Wooden ruler
5. Corpse
6. Snail
7. Steak
8. Pork chops
9. Salad
10. Bread
11. Plant
12. Hair
13. Finger nails
14. Cotton
15. Wool
16. Grapes

ABIOTIC

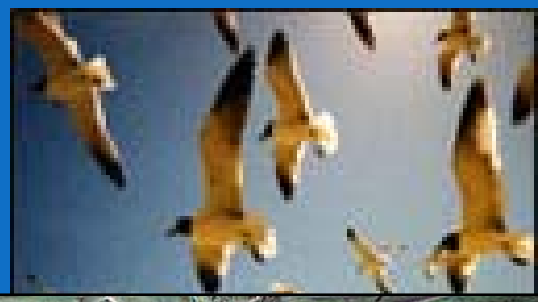
1. Clock
2. Water
3. Glass
4. Aluminum
5. Sand
6. Clouds
7. Pipe
8. Gold
9. Plastic
10. Air

BOTH:

Virus

What Is a Population?

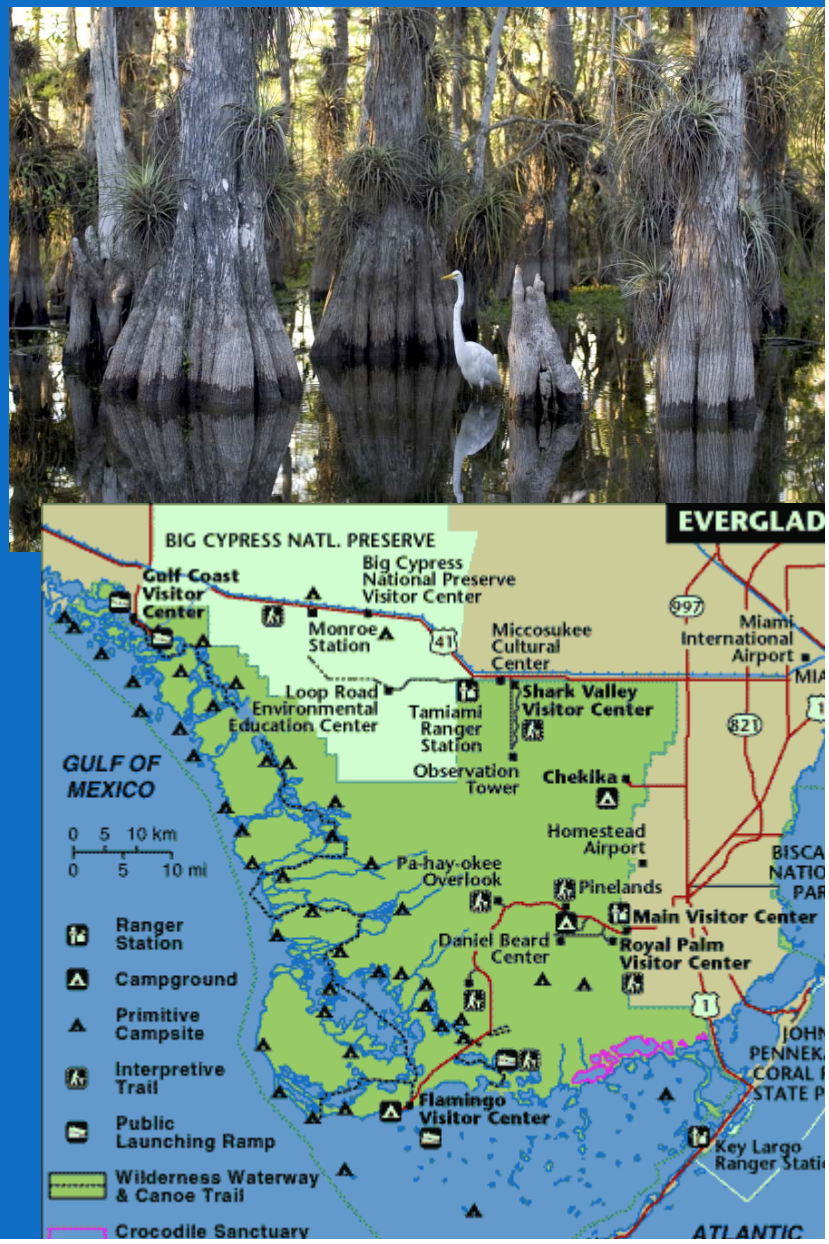
- *In population ecology* a **population** is:
  - a group of ORGANISMS of the same species inhabiting the same area…
  - all members of a single species that live together in a specified geographic region



What Is a Community?

✓ *In ecology* a **community** is:

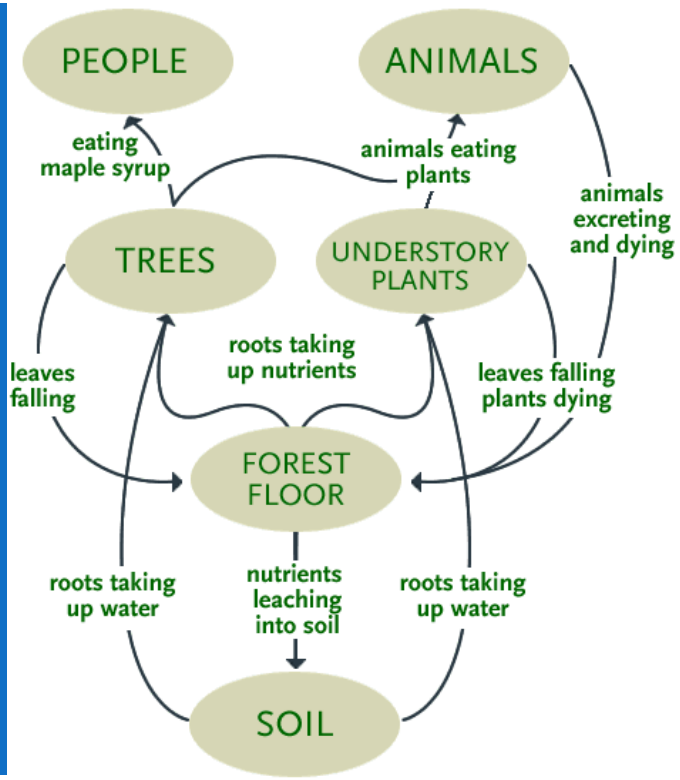
- a group of different species that live together in one area
- Examples are: groups of alligators, turtles, birds, fish, and plants that all live together in the Florida Everglades

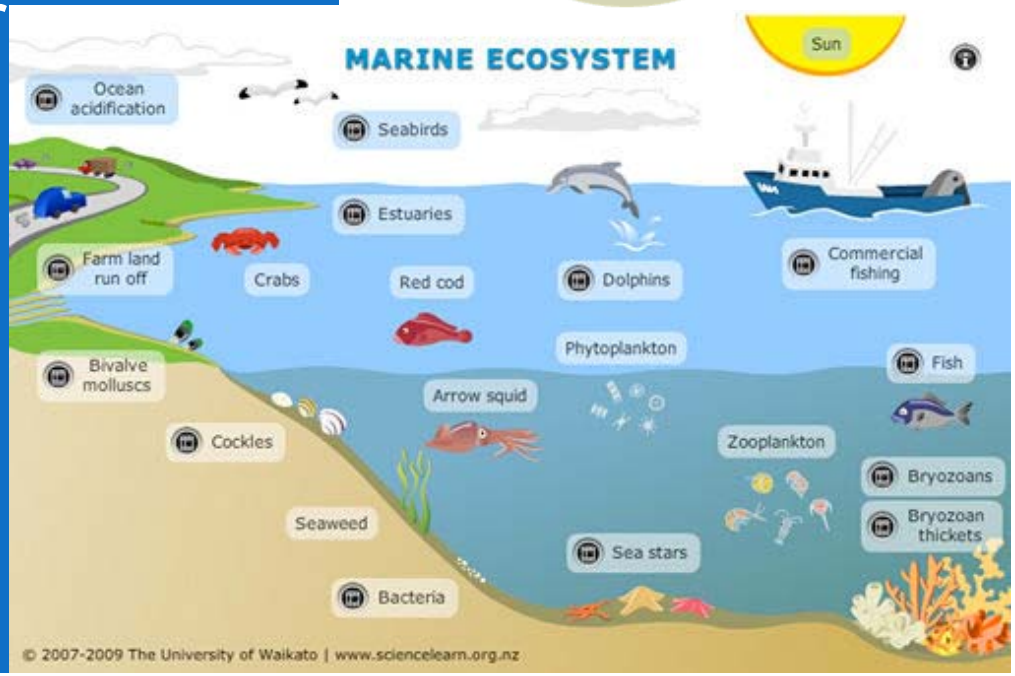


What Is an Ecosystem?

✓ *In ecology* an **ecosystem** includes:

- All the organisms as well as the climate, soil, water, rocks and other abiotic factors in the environment.
- This could be a decaying log that may be part of a larger wetland ecosystem

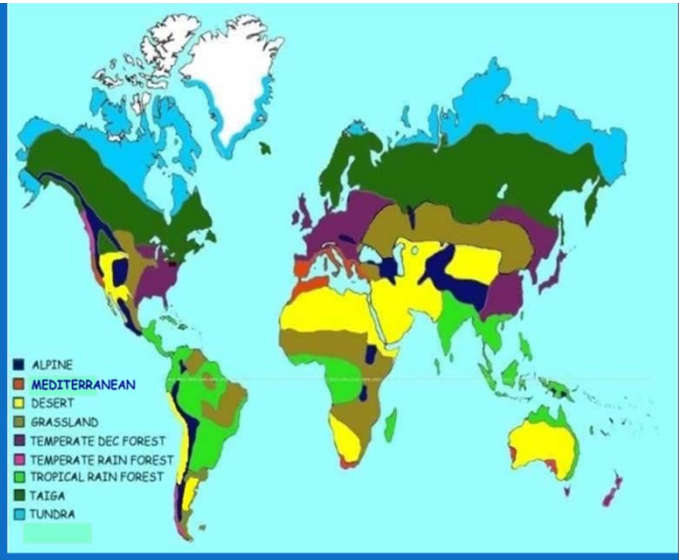




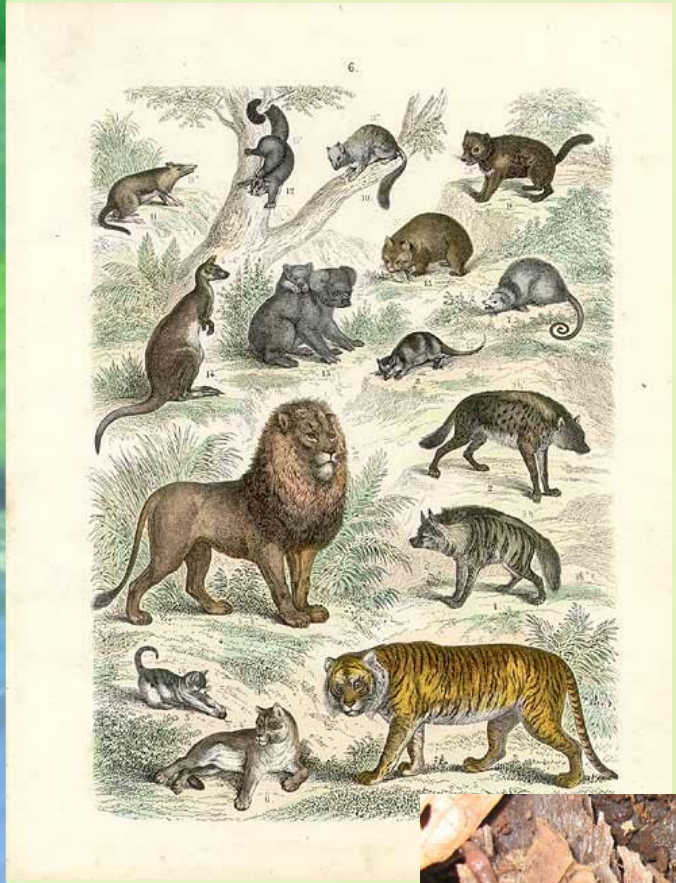
What Is an Biome?

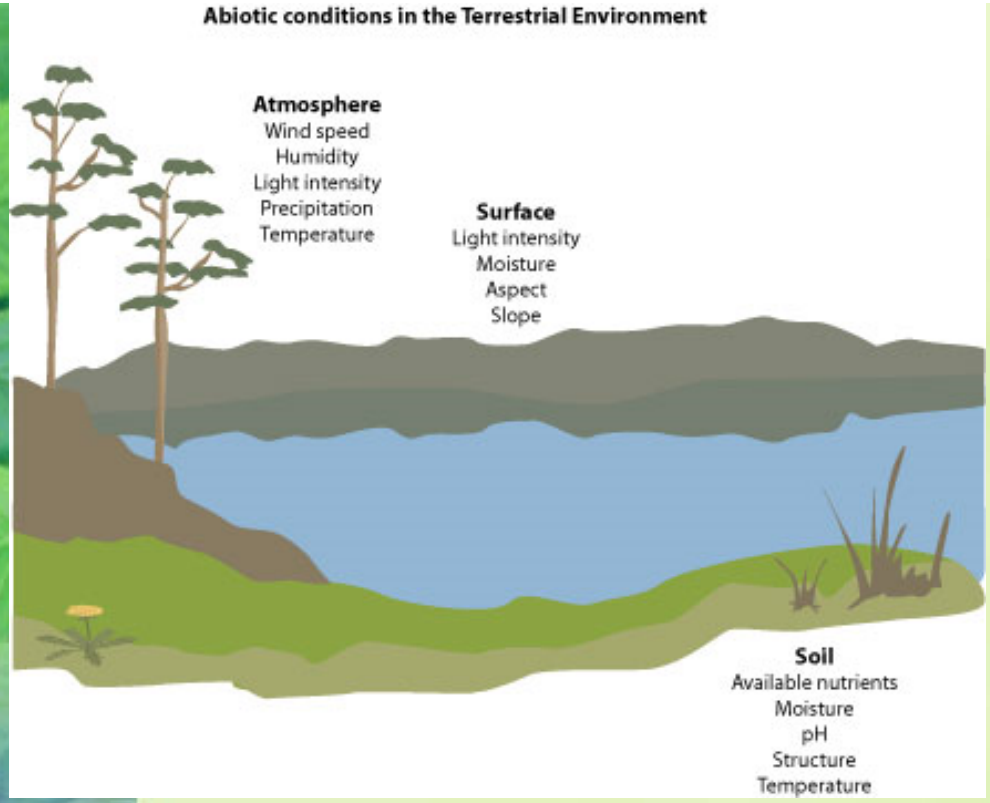
✓ *In ecology* a **biome is**:

- A major regional community of organisms.
- Characterized by the climate & plants that live there.



- *Producers*
  - *Autotrophs*
- *Consumers*
  - Heterotrophs: Herbivores, omnivores and carnivores
- *Decomposers*
  - fungi and bacteria





<u>Packet pg 1</u>

1a) an organism that can make its own food

b) Palm tree, algae, diatoms, seaweed

2) From the sun

3) Ultimate source of food & energy for all consumers

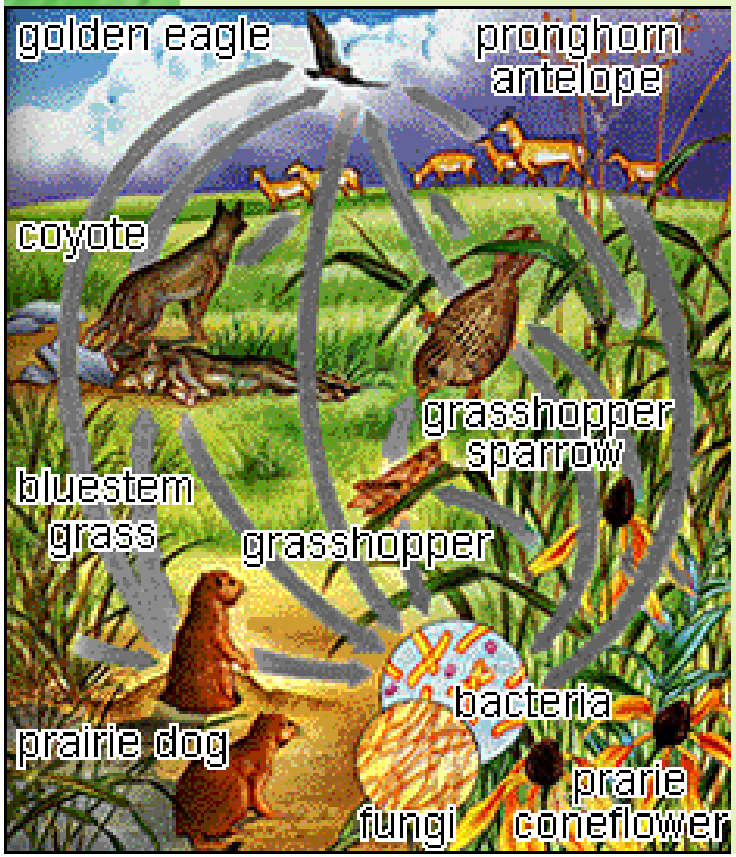
Packet pg 2

4a) organisms that can't make their own food, must consume other organisms.

b) Where they get energy: Herbivore, Carnivore, Omnivore, Decomposer

5) Eating plants, other animals, both or breaking down organic matter

Food chains and webs



Packet pg 3

1)A sequence of who eats whom is called a **food chain**

2a)

Algae=Level 1/ Producer

Sea turtle=Level 2/Primary consumer

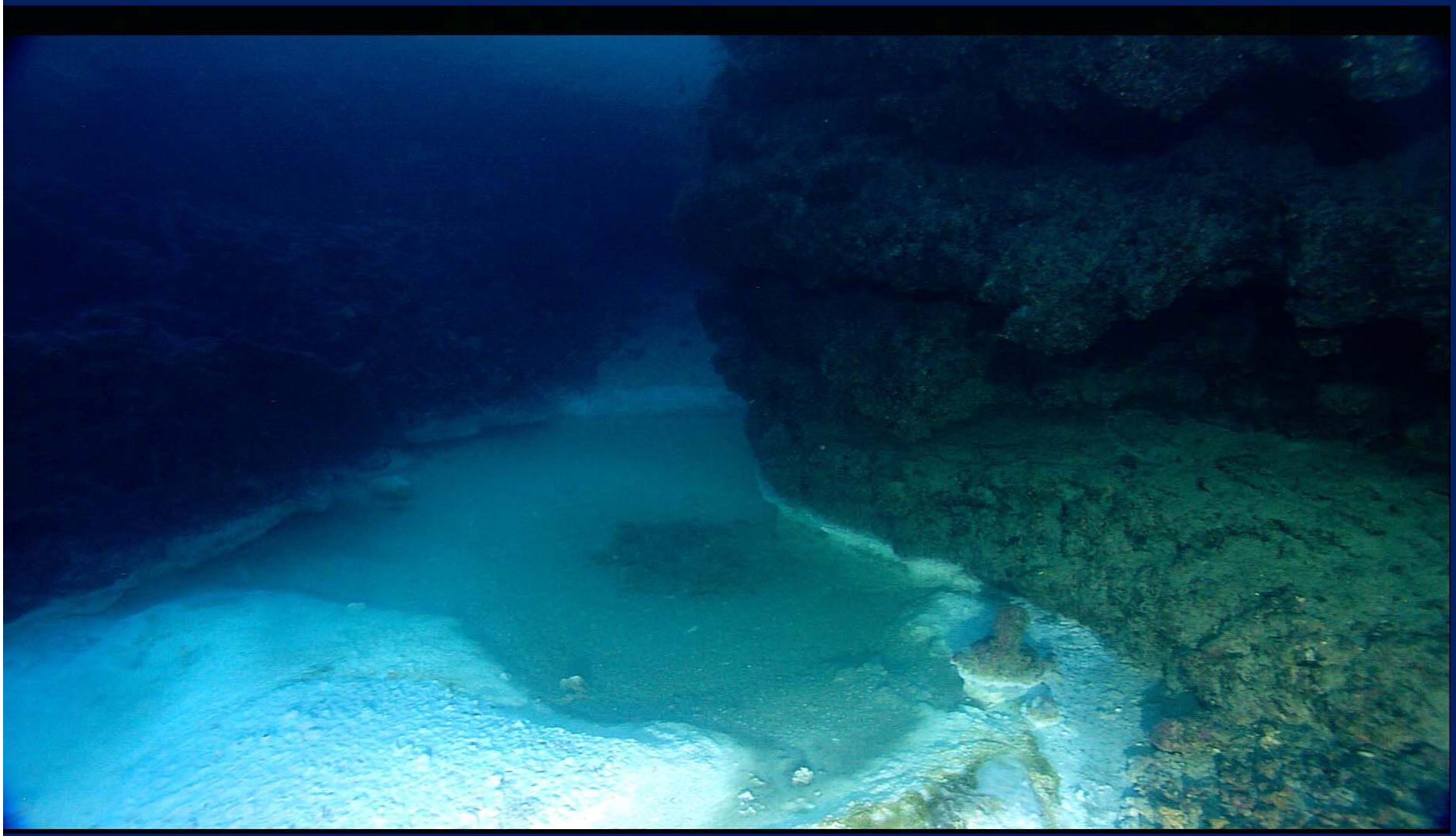
Blue crab=Level 3/2nd consumer

Osprey=Level 4/Tertiary consumer

b) The sun

c) Energy is depleted

Deep Ocean Brine Pool



Deep Ocean Brine Pool

Packet pg 4

Food Webs…

- **Many food chains…**
- **Made up of trophic levels….**
- **Includes producers – consumers - decomposers**

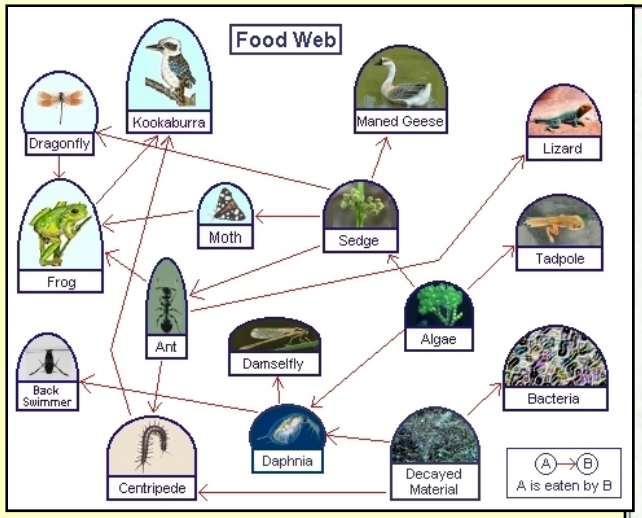
Troph=nourish/food
Auto=Self
Hetero=Different

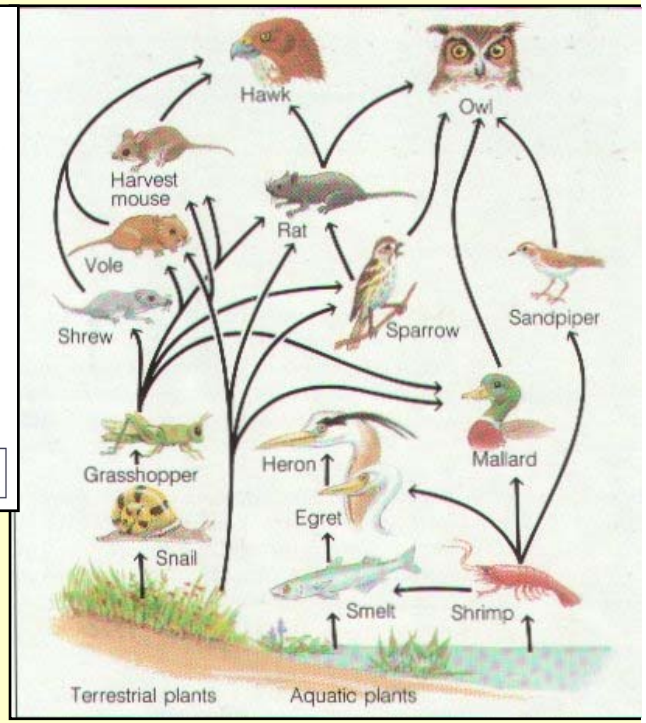
producers = autotrophs; plants, algae

consumers = heterotrophs; mostly animals

decomposers = bacteria, fungi – are also heterotrophs

1) Interconnected food chains comprise **food webs** in which the same food resource is often part of more than one food chain
2) Less food chains

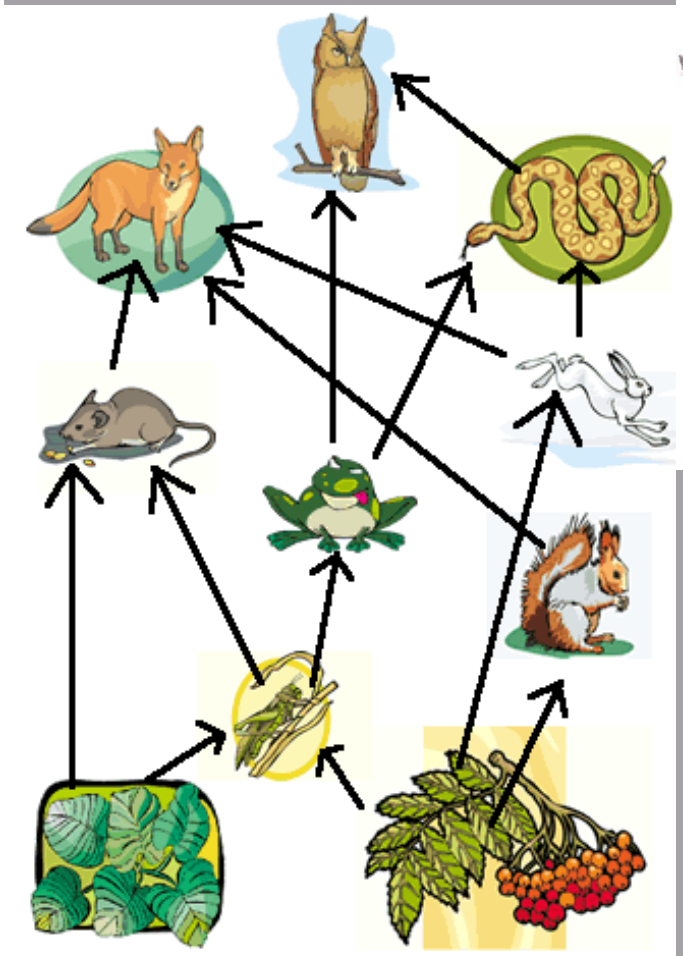


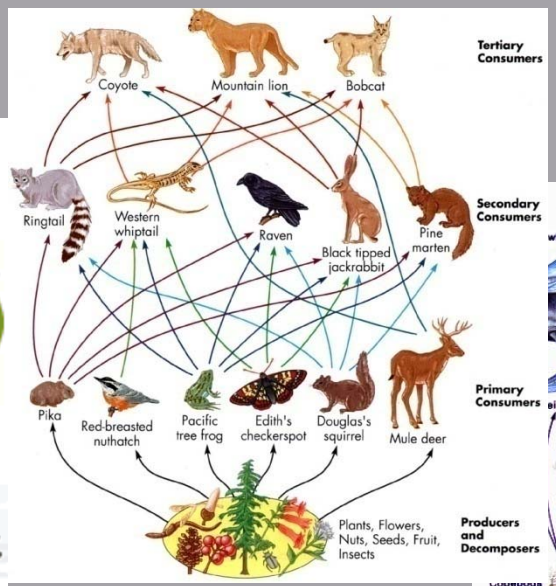


➢**Arrows point to the one eating= the direction of energy flow**

More Food Webs…

- More complex/complicated → More realistic





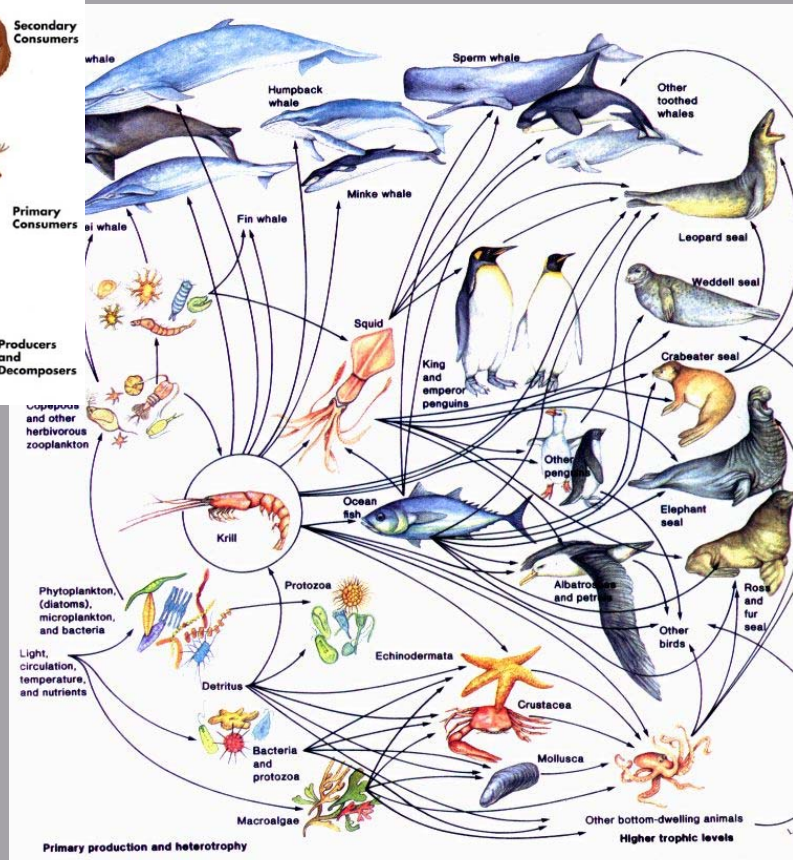
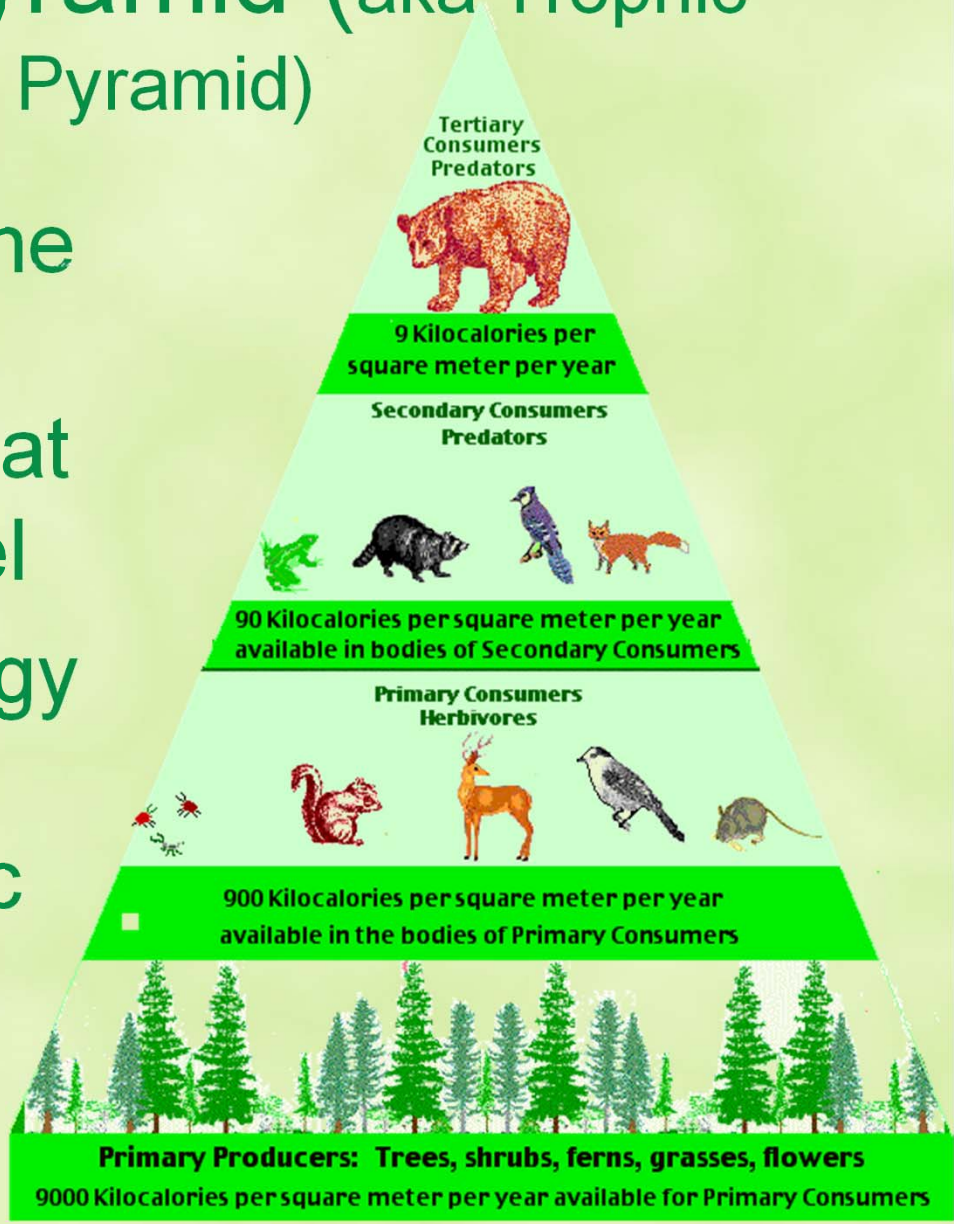


FIGURE 15.3 Food Webs. An Antarctic food web. Small crustaceans called krill support nearly all life in Antarctica. Krill are eate 6 species of baleen whales, 20 species of squid, over 100 species of fish, 35 species of birds, and 7 species of seals. Krill feed on algae, protozoa, other small crustaceans, and various larvae.

Ecological Pyramid (aka Trophic Level Pyramid)

- An ecological pyramid shows the biomass (amt of life) of members at each trophic level
- Also shows energy losses at each transfer in trophic level
- Biomass=amt of living material



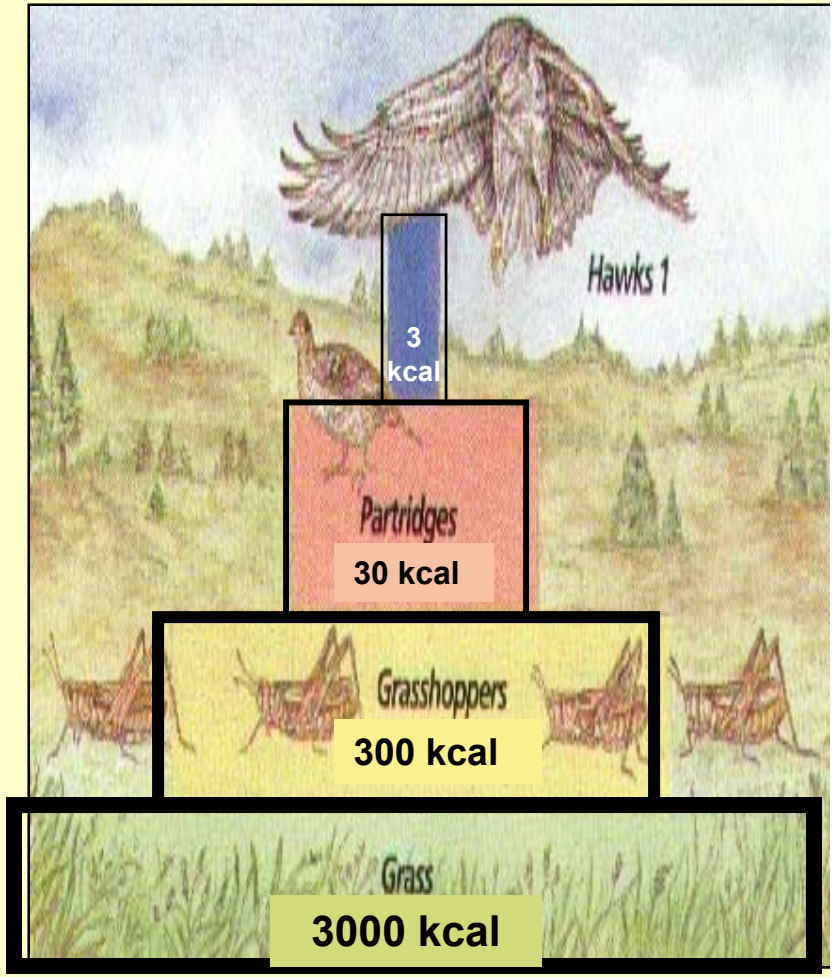
Trophic Level Pyramid

- NOTICE the #'s on the pyramid…..

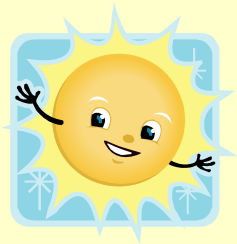
- **10% of the energy consumed is available to the next = less energy = less levels = fewer organisms at top!**

- Producers absorb energy from sun → only part of the energy from Sun becomes part of plants' structure→ The other part is used for…….

living & growing or **lost as HEAT**



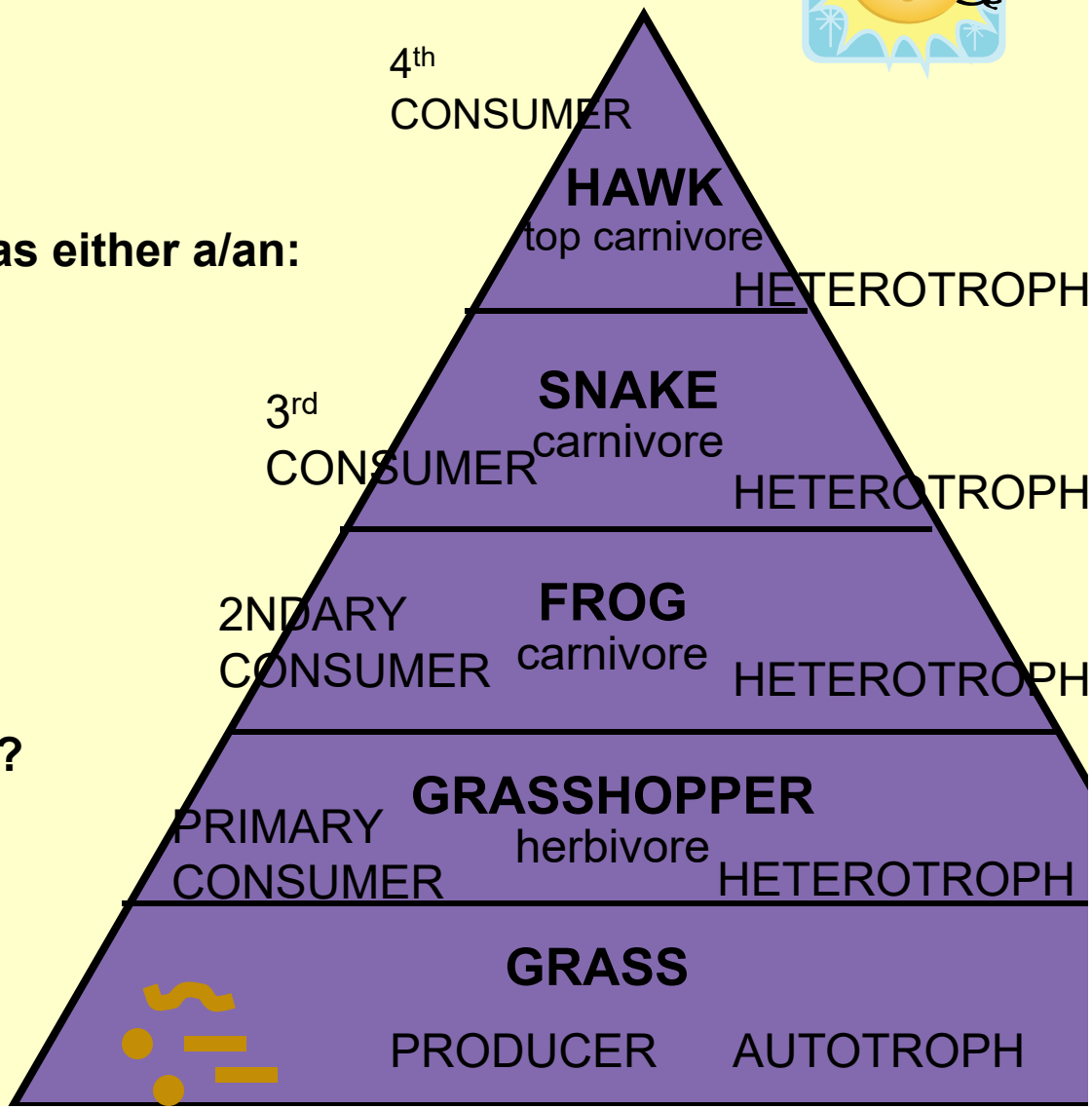
Trophic Level Pyramid



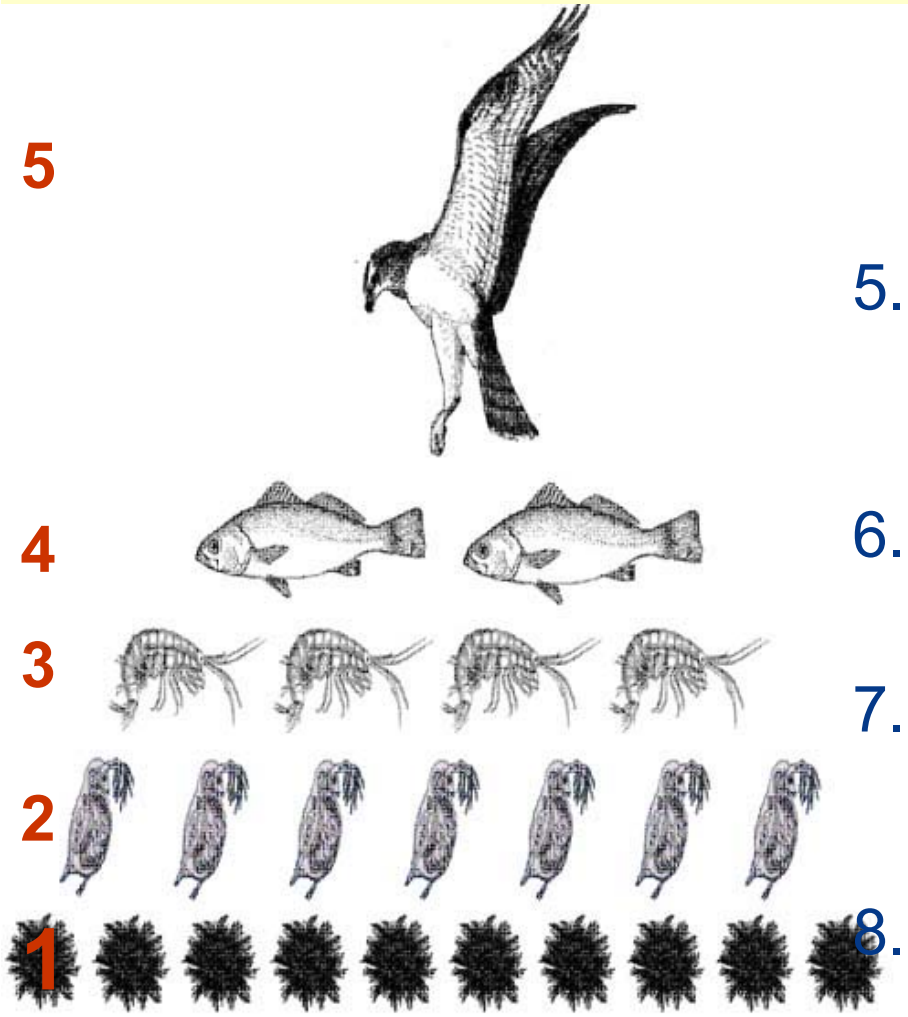
1. **Put these in the correct order on the pyramid**
   1. Hawk
   2. Grass
   3. Snake
   4. Grasshopper
   5. Frog
2. **Label each organism above as either a/an:**
   1. Producer
   2. Autotroph
   3. Heterotroph
   4. Primary consumer
   5. Secondary consumer
   6. 3rd order consumer
   7. 4th order consumer
3. **What two things are missing?**

The Sun …

Decomposers…



Trends in Trophic Level Diagrams



4. What do you notice about the numbers of organisms from bottom to top? Explain. **Get fewer organisms, less energy available**

5. How does the size of the organism change as you move through the levels? **gets larger**

6. What level in an energy pyramid is held by the producers? **1st**

7. Where is there more 'biomass' & more energy in a trophic pyramid? **1st**

8. What organism in the pyramid has the greatest energy needs?

Hawk **Why?**