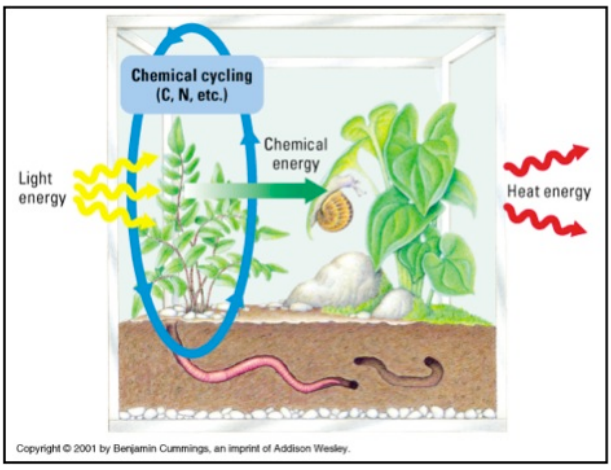
Ecosystem Structure & Function Warm-ups:

Ecosystem Structure & Function PPT Notes Name:_____

Part 1 – Interactions



I. Ecosystem Background

Ecology studies interactions between organisms and their environment.

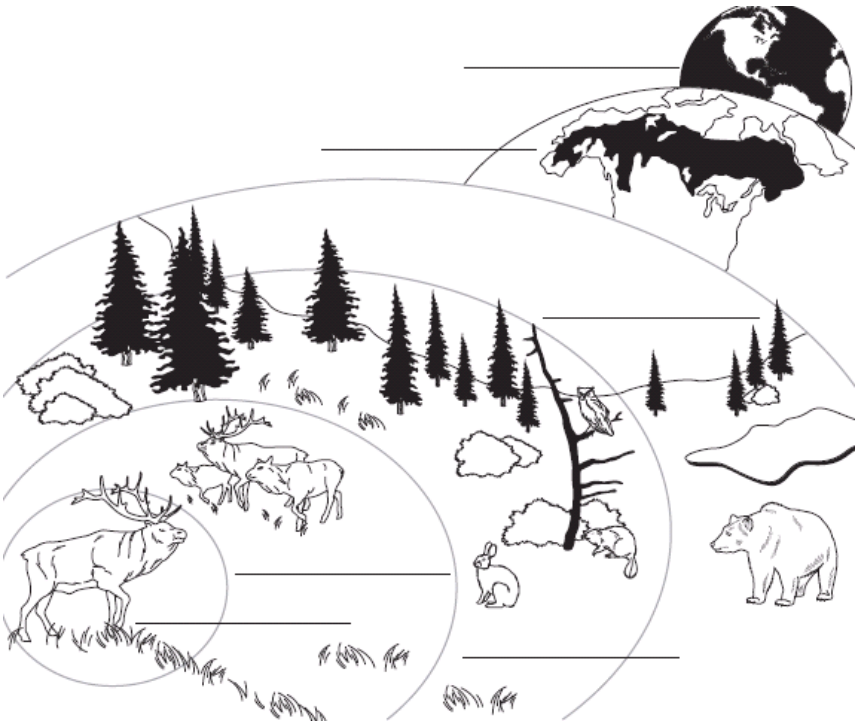
Environmental science adds the human component.

II. Ecosystem Components:

1. Ecosystem: A community of _____

and the _____ they inhabit.

2. Organization:



3.

ABIOTIC FACTOR =	BIOTIC FACTOR =

a. **Brain Break:** classify each of the following words as abiotic or biotic.

pH	**consumer**	**soil structure**
humidity	**parasite**	**detritivore**
light intensity	**temperature**	**producers**
precipitation	**nutrients**	**moisture**
wind speed	**competitors**	**thorns**
symbiotes	**predators**	**dissolved oxygen**
decomposing leaves	**salinity**	

b. Abiotic Interactions
   i. Major factors in terrestrial and aquatic ecosystems

_____	_____
• Sunlight • Temperature • Precipitation • • • •	• Mineral availability • Temperature • pH • light depth • water currents • •

   ii. Abiotic factors affect animal and plant species, but also _____ and

   _____ with time themselves

- Ex: Temperature depends upon:
  - Solar radiation, wind speed, time of year, day, altitude, and aspect
- Temperature affects:
  -
- Changes in temperature affect:
  -

c. Biotic Interactions

•	•
•	•
•	•
•	•

   i. Competition: Interspecific or Intraspecific
   Interspecific competition is between members of a _____ _____ for space,

   food, light (niches), while **intra**specific is between the _____

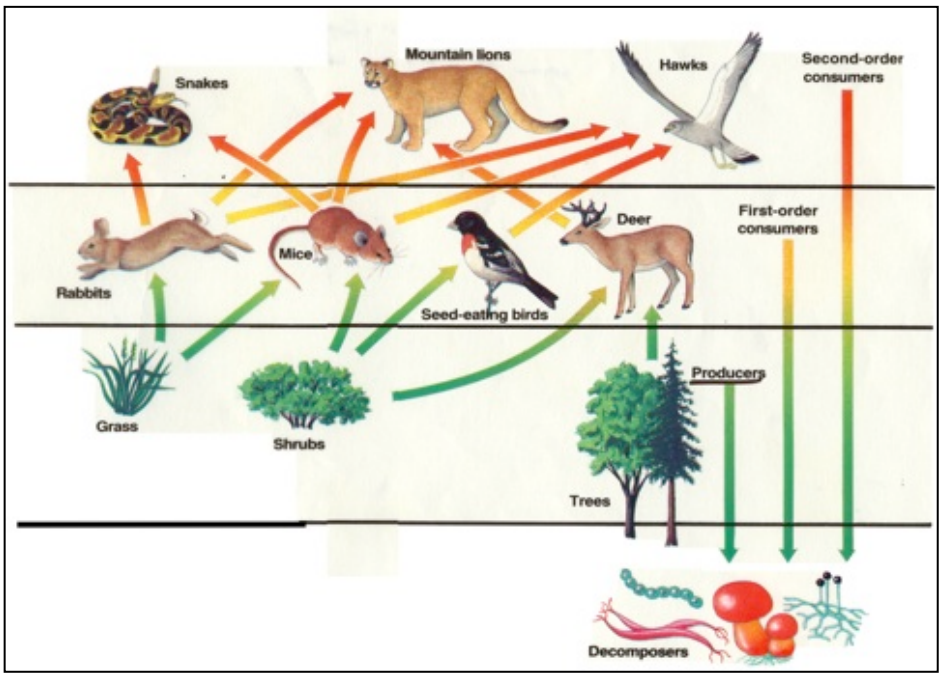
   _____ for space, food, or mates.

d. Significance of Abiotic & Biotic Factors: both can act as _____ _____. These factors prevent individuals or populations from growing.
   i. Examples

Part 2 – Energy Flow

I. Structure based on feeding relationship

a. Each organism in a food chain represents a _____



b. Limitations:

c. Food Chain Clarification:

i. many producers are invisible to naked eye:

ii. humans _____ always occupy the top spot of the food chain

iii. _____ interconnect all trophic levels and _____ nutrients

iv. food chains are an _____ _____

v. role of _____ is to _____ energy

vi. role of _____ is to _____ energy

d. Transfer v. Transform

- Transformations: _____ of energy or a _____ (from gas, liquid, solid)
- Transfer: _____ of same form of energy or type of chemical
- Practice

1. Water moves dead leaves downstream…
2. CO_2 is used to create glucose…
3. Water evaporates from stomata on a hot day
4. Detritivores break down dead flesh

II. Ecosystem Function

a. Feeding relationships allow energy to be transformed, transferred, or _____. So the function of these feeding relationships is to _____ ecosystems with energy and _____ _____.

b. **Photosynthesis** (OX pg. 31)

i. _____ _____ is transformed into _____ _____($C_6H_{12}O_6$) by photosynthesis

c. **Respiration** (pg. 31)

i_____ (glucose) is TRANSFERED by consumption

ii. Chemical energy is _____ when converted into a usable form by the consumers during respiration (mostly given off as heat because process is inefficient)

III. Energy Budget

1. **Big Picture:** all chains begin with _____ _____. Energy lost as heat or waste at each step (average is _____%)

2. Details:

a. Only a tiny % of incoming solar radiation is stored in plant's chloroplasts (0.06%). Of that % only _____% of sunlight energy is stored as biomass.

b. Most energy is lost as heat each step

a. EX: Sun → chloroplast (plant) → stored sugars

c. Laws of thermodynamics

- 1st Law: Energy can neither be _____ or _____, it can only_____.
- 2nd Law: Energy goes from _____ form to a _____

Brain Break:

- **Independent Write:** ***Thinking about the laws of thermodynamics. Justify if your diet is environmentally responsible and defend.***

- **Share:** ***Each person introduces themselves and share what they think.***

3. Implications of Energy Budget

a. Models of feeding relationships - _____

i. Pyramid of Numbers

- Total number of _____ for each trophic level
- Length of each bar gives relative proportion
- Helpful in comparing populations _____ (seasonal, short term)

ii. Pyramid of Biomass

- Total dry mass for _____ (g m^2)
- Can be for a _____, _____, or trophic level
- Does not bias based on size of organism like pyramid of numbers

* Know limitation of all pyramids in OX and SBS.

- Brain Break: How does the structure of these pyramid affect lower and higher trophic level consumers?