Energy in Ecosystems

Where does all the energy go?

REMEMBER TO TAKE CORNELL NOTES! 😊
Where do ecosystems fit in?

Biosphere

→ Ecosystems

→ Communities

→ Populations

→ Individuals
What are the energy laws?

2 Laws of Thermodynamics:

1) Energy cannot be created nor destroyed.

2) Energy can be transformed into different types of energy.

- Energy flows through ecosystems.
- It cannot be recycled.
How does energy flow through ecosystems?

- Begins with the sun...
- Producer $\rightarrow$ Consumers
  - 1’ consumers (herbivores)
  - 2’ consumers (carnivores)
  - 3’ consumers (omnivores)
- Some energy is lost as heat
What are the different ways organisms acquire energy?

They can be...
- Producers
- Consumers
- Decomposers
What are Producers?

Organisms that produce their own food from the sun's energy

Autotrophs = “self-feeders”

Ex. Plants, some photosynthetic bacteria & protists
What are Consumers?

Organisms that **consume** other organisms for energy

**Heterotrophs** = “other-feeders”

Ex. All animals (herbivores, carnivore/predators, omnivores, scavengers, etc)
What are Decomposers?

Organisms that consume dead organic matter for energy

*Saprotrophs* = “detritus-feeders” aka detritivores

Ex. Fungi, some bacteria
What is a Food Chain?
A FOOD CHAIN shows the transfer of energy from the sun to producer to primary consumer then to higher order consumers.
What is a Trophic Level?

A TROPHIC LEVEL is a “feeding level”. Producers are (T1) or Trophic Level 1.
Identify the...

- Producer (T1)
- Primary Consumer (T2)
- Secondary Consumer (T3)
- Tertiary Consumer (T4)
- Quaternary Consumer (T5)

Which direction does energy flow?
Another way of showing the transfer of energy in an ecosystem is the energy pyramid.
What is an energy pyramid?

Energy pyramids show the amount of available energy for each trophic level.

Only 10% of the available energy is transferred from one trophic level to the next.
Food Chains Show Available Energy

1 unit of energy

10 units of energy

100 units of energy

1000 units of energy

producers

first level consumers

second level consumers

top level consumer
What is a Food Web?

- Interconnected food chains
- Show the complex feeding relationships in an ecosystem
Identify the...

Producers
1' Consumers
2' Consumers
3' Consumers
Any
Questions?