

**Standard:** Students will assess the dependence of all organisms on one another and the flow of energy and matter within their ecosystems.

**Element:** Investigate the relationships among organisms, populations, communities, ecosystems, and biomes.

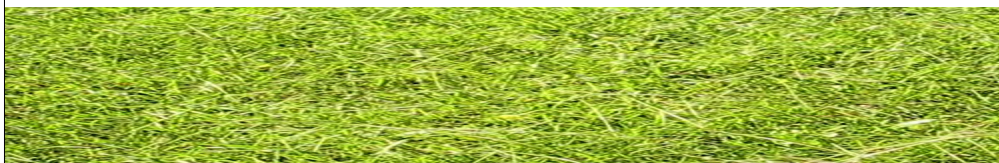
**EQ:** How does energy flow through ecosystems?



## Food Chains and Webs



Organisms that produce energy during photosynthesis are called **PRODUCERS.**



Producers are **autotrophs** and the most common examples are **plants**.

Organisms that can't make their own energy are called **CONSUMERS**.



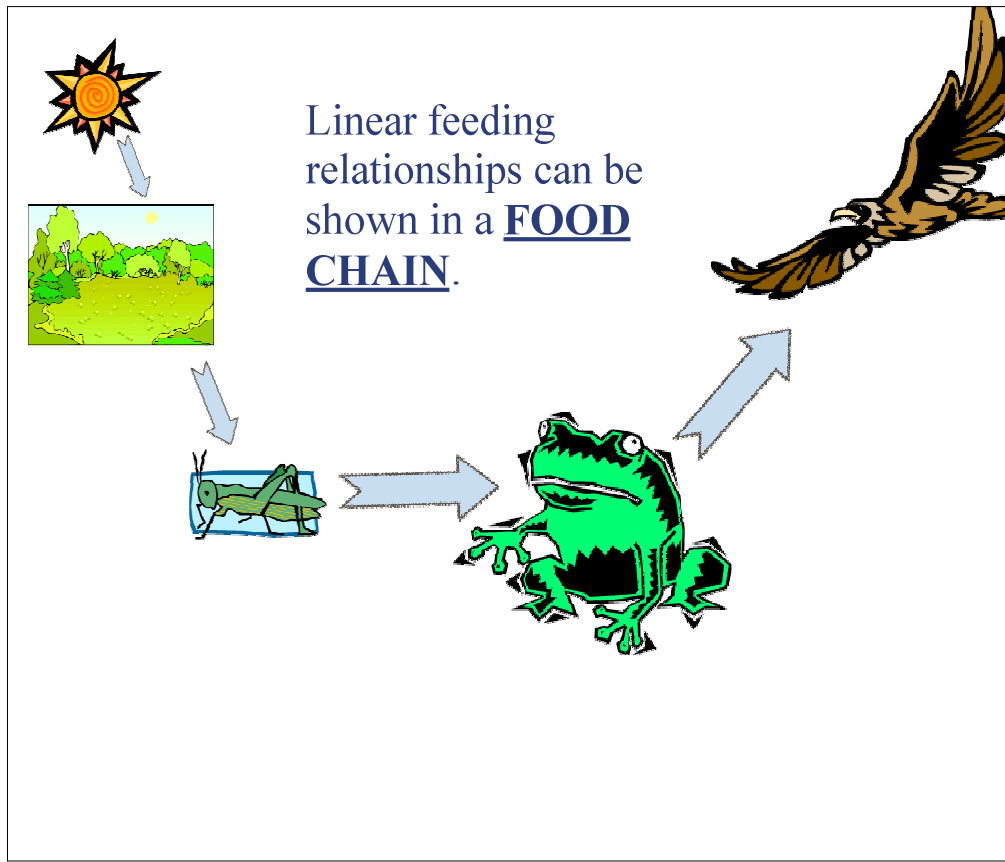
Consumers are **heterotrophs**. Consumers must eat other organisms for food. **Animals** are examples of consumers.

Consumers that eat producers are called **primary consumers**. They are **herbivores**, meaning they eat only plants.



Consumers that eat other consumers are called **secondary consumers**. They are **carnivores**, meaning they only eat meat.





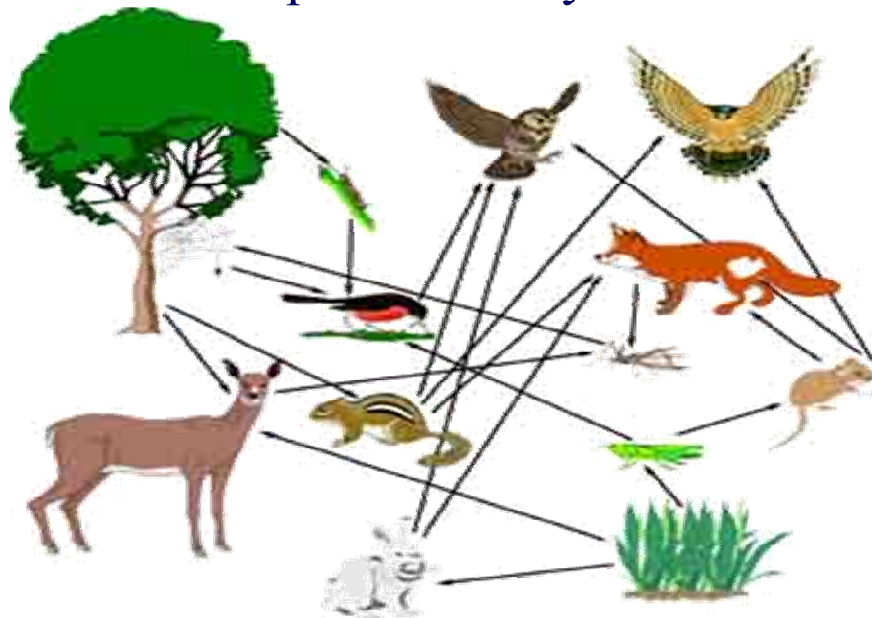
Grass>>Insect>>Frog>>Snake

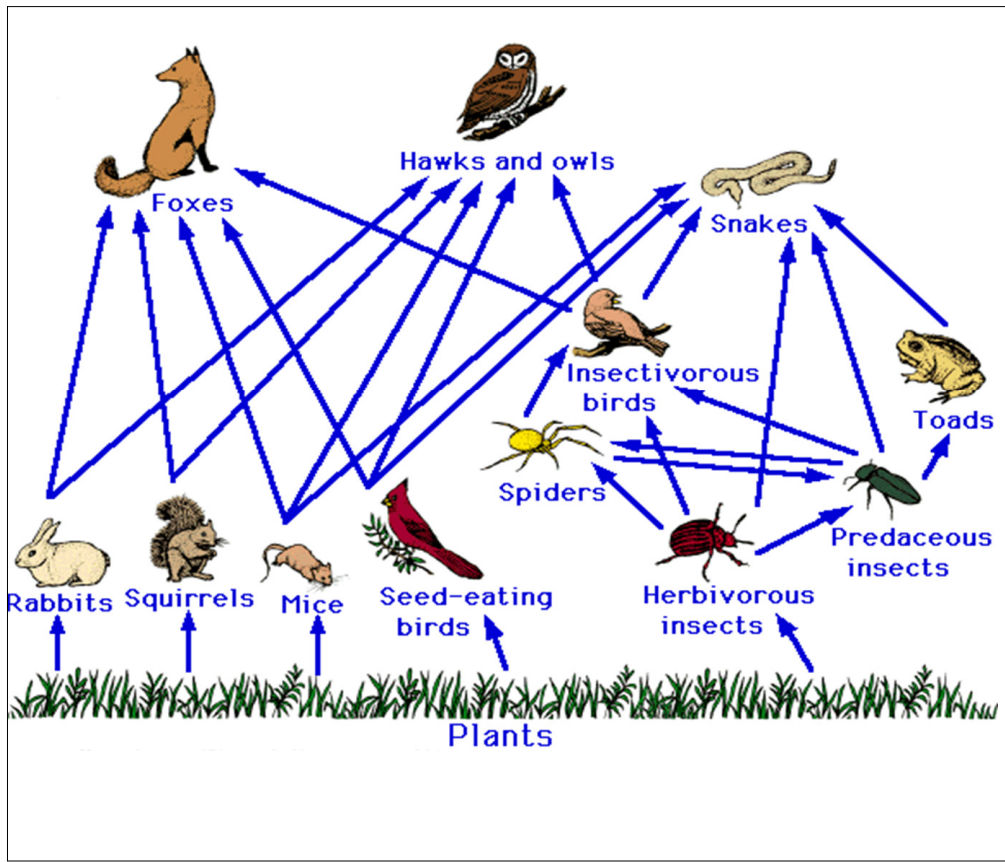
Producer>>Primary>>Secondary>>Tertiary  
Consumer Consumer Consumer

Plant>>Herbivore>>Carnivore>>Bigger carnivore

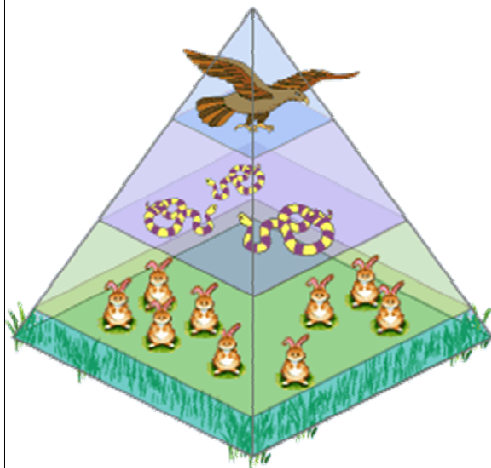
Food chains are a bit over simplified. Most animals rely on a variety of food sources. **Food Webs** give a more detailed illustration of who's eating whom.

Food Webs are interconnected food chains. They show the feeding relationships in an ecosystem.





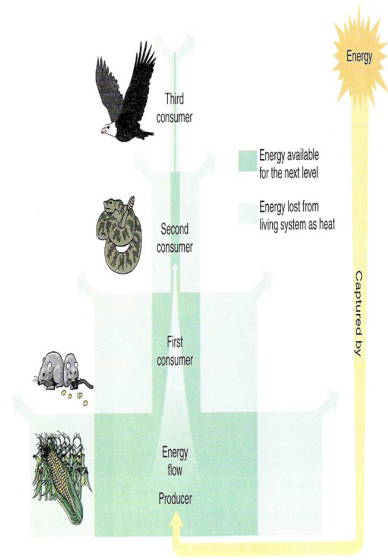
## Energy pyramids show:



- That the amount of available energy decreases as you move up the pyramid.



Only **10%** of the energy at one trophic level is available to the next:



- One Man
- 300 Trout
- 90,000 frogs
- 27,000,000 grasshoppers
- 1000 tons of grass

# Why?

- energy transfer is inefficient
- energy is lost as heat

