

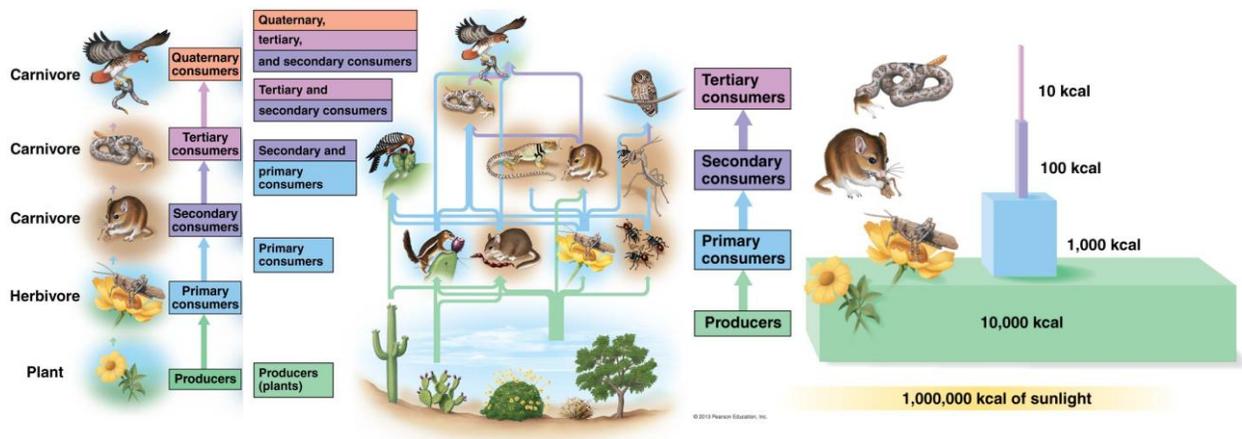
Energy Flow Worksheet

- Identify three reasons organisms need energy.
- Where does the energy for most ecosystems originate? How is this converted into the energy in food?
- Describe the basic movement of energy through an ecosystem.
- Match the following terms (there may be more than one match per term):

(a) Autotroph	i. Detrivore
(b) Heterotroph	ii. Ominvore
(c) Primary consumer	iii. Carnivore
(d) Secondary consumer	iv. Herbivore
(e) Tertiary consumer	v. Producer
(f) Decomposer	

- Identify each of the following ecological models for energy flow and briefly describe what they represent:

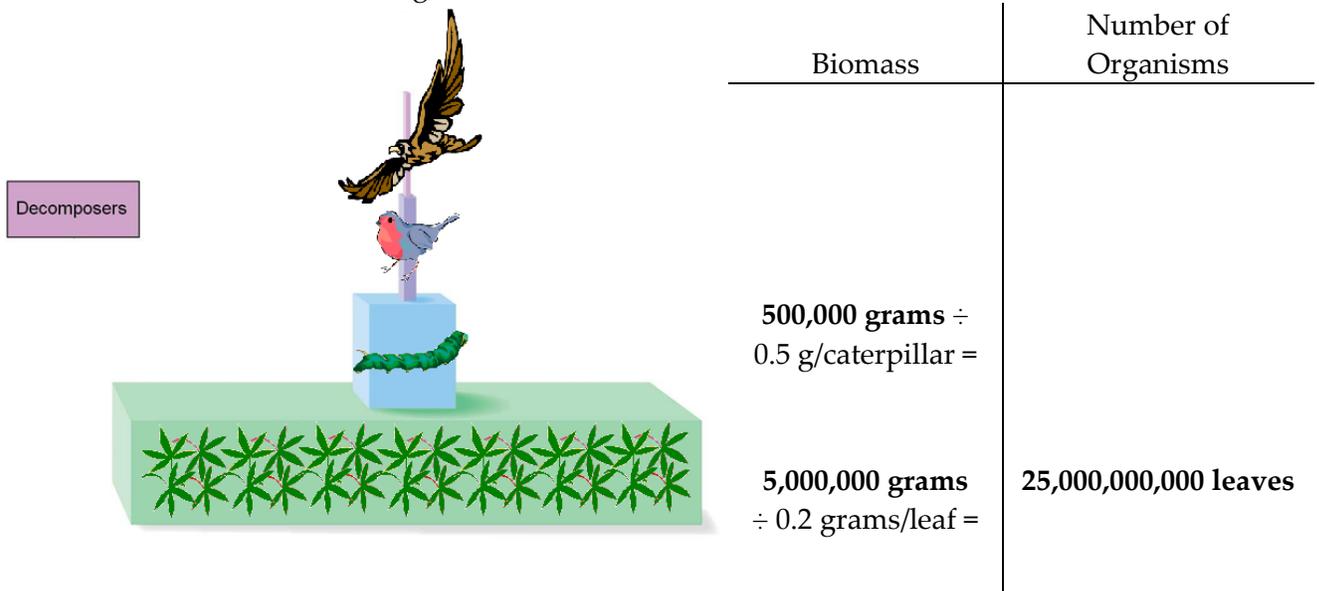
Ecological Model:



What does this represent?

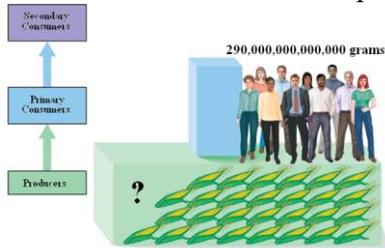
- What is the role of each of the following types of organisms in an ecosystem?
 - Producers?
 - Consumers?
 - Decomposers?
- What is biomass? Why do ecologists measure biomass?
- How is productivity of an ecosystem measured?
- What is the difference between gross primary productivity and net primary productivity?
- According to the "ecological rule of thumb," how much energy is typically passed from one trophic level to another?

11. What happens to the energy that is not passed on to the next trophic level?
12. Why are food chains limited to a maximum of five levels?
13. Why does the population size decrease as you move up the food chain?
14. Refer to the trophic diagram you created. Assume that there are 25,000,000 leaves with a mass of 0.2 grams each, making up a biomass of 5,000,000 grams at the producers level. Calculate the number of hawks that could be supported by the food chain leaves → caterpillar → robin → hawk if:
 - 1 caterpillar has a mass of 0.5 grams
 - 1 robin has a mass of 75 grams
 - 1 hawk has a mass of 1,000 grams

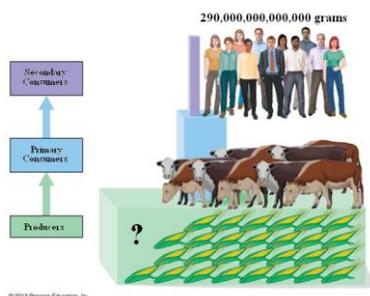


15. According to one study, the mass of the entire human population is approximately 290,000,000,000,000 grams. Assuming that 1 ear of corn weighs approximately 130 grams and the average cow weighs 700,000 grams, calculate how many ears of corn are needed to feed the human population in the following scenarios:

(a) If humans were herbivores/primary consumers.



(b) If humans were carnivores/secondary consumers.



- (c) Which type of diet for humans can feed the most people with the smallest amount of corn? Why?