

Ecological Energy Pyramid

Directions:

1. **First pyramid side** (next to tab), at the bottom of the first layer label “**autotrophs, heterotroph**”. Label each level of the first pyramid side with the following terms as you move up the pyramid: autotrophs, heterotroph, heterotroph, and heterotroph.
 - a. On the back of triangle write:
 - *Autotrophs are organisms such as plants or algae that make their own food through photosynthesis using the Sun’s energy. They are also called producers*
 - *Heterotrophs are living things that cannot make its own food and instead obtains its food by taking in organic compounds, breaking them down is a process called cellular respiration. Also called consumers.*

2. **Second pyramid side**, At the bottom of the first layer label “**trophic levels**”
 - a. Label each level of the second pyramid side with the following terms as you move up the pyramid: producers, primary consumers (herbivores), Secondary consumers (carnivores), Tertiary consumers (top carnivores).
 - b. On the back of triangle write:
 - *The trophic level of an organism is the position it occupies in a food chain, energy flows up a trophic level. The organisms of a chain are classified into these levels on the basis of their feeding behavior.*

3. On the **third pyramid side**, At the bottom of the first layer label “10% Energy Rule in a Food Chain”
 - a. Label each level of the third pyramid side with the following terms as you move up the pyramid: 10,000 J of energy, 1,000 J of energy, 100 J of energy, 10 J of energy
 - b. On the back of triangle write:
 - *The 10% Rule means that when energy is passed in an ecosystem from one organism to the next, only ten percent of the energy will be passed on. Energy is used by organism to live and is transferred to mechanical and thermal energy.*

4. On the **fourth pyramid side**, At the bottom of the first layer label Example “organism examples”
- a. On the **fourth pyramid side** draw a picture of what might belong in each level:
- 1st: flowers, grass, trees, algae
 - 2nd: caterpillars, cows, grasshoppers, beetles, small fish
 - 3rd: humans, birds, frogs, penguins, seals, larger fish
 - 4th: lions, dogs, snakes, killer whales
- b. On the back of triangle write:
- *When any organism dies, detritivores (like vultures, worms and crabs) eat them up. The rest are broken down by decomposers (mostly bacteria and fungi), and the exchange of energy continues. Decomposers start the cycle again.*

Using colored pencils

5. Shade the first (bottom) level of each pyramid green.
6. Shade the second level of each pyramid yellow.
7. Shade the third level of each pyramid blue.
8. Shade the fourth (top) level of each pyramid red.
9. Cut on the dotted line. Now cut out the outer shape of your pyramid and fold on the lines radiating from the center. Use a paper clip to hold together

Answer the following questions in your journal using your pyramid.

1. What are 3 terms used to describe organisms such as trees?
2. What are 3 terms used to describe organisms such as cows?
3. Do organisms always stay in the same level? Explain your answer.
4. What is the original source of energy for most living organisms?
5. Is there more energy stored in the producer level or consumer levels? Why?
6. Why is the energy transfer between trophic levels not even close to 100% efficient?
7. Which would conserve more energy, if all humans ate only vegetables or ate only meat? Explain your answer.

