

## Learning About Energy Pyramids

When an organism in an ecosystem eats food, it obtains energy. The organism uses some of this energy from food to move, grow, reproduce and carry out other life activities. This means that only some of the energy will be available to the next organism in the food web.

A diagram called an energy pyramid shows the transfer of energy through a food chain. The most energy is available at the producer level. At each level in the pyramid, there is less available energy than at the level below.

In general, only about 10 percent of the energy contained in one level of a food web is transferred to the next, higher, level. The other 90 percent of the energy is used in life processes. Because of this most food webs only have three or four feeding levels.

Each level of the pyramid is called a trophic level. Trophic means nutrition or feeding. Producers are called autotrophs – *auto* meaning self. So they are “self feeding”. Consumers are called heterotrophs – *hetero* meaning other. So consumers feed on other organisms or “other feeding”.

The first level of an energy pyramid is the producer or autotroph. If we have a fantasy ecosystem and say that the producers have 1000 units of energy (kilocalories – kcal) what amount of energy could be transferred to all the other consumers (heterotrophs)?

Producer's Energy		Energy transferred to the Primary Consumer
1000	X .10	100

Primary Consumer's Energy		Energy transferred to the Secondary Consumer
100	X .10	10

Secondary Consumer's Energy		Energy transferred to the Tertiary Consumer
X .10		

**Materials:** Energy Pyramid to cut out, colored pencils  
**What To Do:**

- DO NOT cut out the pyramid until you are finished with these instructions.
- There are four sides on your pyramid. Each side will have different information placed on it.
- Label each level of the first pyramid side with the following terms as you move up the pyramid: producer, primary consumer, secondary consumer, tertiary consumer.
- Place the amount of energy available for each level from your previous calculations.
- Label each level of the second pyramid side with the following terms as you move up the pyramid: plants, herbivores, carnivores, top carnivores.
- Label each level of the third pyramid side with the following terms as you move up the pyramid: autotroph, 1<sup>st</sup> order heterotroph, 2<sup>nd</sup> order heterotroph, 3<sup>rd</sup> order heterotroph.
- Draw a picture of what might belong in each level:
  - flowers, trees, grass algae
  - caterpillars, cows, grasshoppers, beetles
  - humans, birds, frogs
  - lions, dogs, snakes
- Shade the first level (bottom) of each side green.
- Shade the second level of each side yellow.
- Shade the third level of each side blue.
- Shade the fourth (top) level of each side red.
- Cut out the pyramid and fold on the lines radiating from the center and stand it up.

13. Answer the questions on the next page and then glue the flat pyramid to page 81.

**Questions:**

- 1. What are three terms used to describe organisms such as trees? \_\_\_\_\_
- 2. What are three terms used to describe organisms such as cows? \_\_\_\_\_
- 3. What are three terms used to describe organisms such as humans? \_\_\_\_\_
- 4. What are three terms used to describe organisms such as lions? \_\_\_\_\_
- 5. What do autotrophs eat? \_\_\_\_\_
- 6. What do heterotrophs eat? \_\_\_\_\_
- 7. What happens to the amount of energy in the pyramid as it moves through the different levels? \_\_\_\_\_
- 8. Do organisms always stay in the same level? \_\_\_\_\_  
Explain your answer. \_\_\_\_\_

Watch the two short videos about Tropic Levels and Energy Pyramids from [www.missdoctorbailer.com](http://www.missdoctorbailer.com)

Write down something you learned.

