Energy Flow Through Food Chains

Name:_____

Problem: What is the effect of trophic (feeding) level in a food chain on the amount of energy received from food?

Research:

The sun is the ultimate source of energy for any ecosystem. Producers capture some of the light energy from the sun and transfer it into chemical energy as organic molecules (food). Energy is transferred through the ecosystem along trophic (feeding) levels. Each time energy is transferred, some is lost making less available at the next feeding level. Organisms use much of their energy to carry out life functions. This energy is converted to heat and lost so that only 10% of the energy is passed to the next level when one organism consumes another. A food chain is a simple sequence in which energy is transferred from one organism to another in an ecosystem. Ecosystems, however, are more complex and contain many more species. The food web is a more accurate illustration of energy transfer. Because of the energy lost, there are fewer organisms in each feeding level within the ecosystem.

Hypothesis:

Materials:

*Copies of the Pyramid form
Colored Pencils
* Scotch Tape

Procedures:

1. Shade the first (bottom) level of each pyramid green.
2. Shade the second level of each pyramid yellow.
3. Shade the third level of each pyramid blue.
4. Shade the fourth (top) level of each pyramid red.
5. 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
6. Label each level of the second pyramid side with the following terms as you move up the pyramid:
   plants, herbivores, carnivores, top carnivores
7. Label each level of the third pyramid side with the following terms as your move up the pyramid:
   1000 calories, 100 calories, 10 calories, 1 calorie
8. Draw a picture of what organism might belong in each level for a specific food chain. Write your food chain here & have it approved first!

9. Fold your pyramid on the lines radiating from the center and tape it together.

Data: Your pyramid will serve as your data!

Conclusion Questions:

Do organisms always stay in the same level? Explain your answer.

Why is only 10% of the energy passed on through the trophic levels?

Name three activities that use the other 90% of the energy. Defend your answers.

1.

2.

3.

Why does the energy flow form a pyramid that is smaller at the top? Explain your answer!

Observations from the Teacher Demo:

Container Size	Observations	What it represents

In 2-3 GOOD sentences, explain why the length of food chains is limited. Why can't a food chain be 15 organisms long?