Name: _____ Period: _____

Energy Flow and Feeding Relationships in the Pacific Northwest

OVERVIEW

You will identify producers and consumers in the marine ecosystem of the Pacific Northwest. Using a set of "Pacific Northwest cards," you will first design a food chain with sea otter and kelp and then create an energy pyramid using this food chain. Secondly, you will expand the food chain to a food web based on your research of a specific location of the Pacific Northwest. Finally, revise the energy pyramid based on the food pyramid.

INSTRUCTIONS

You will receive a set of cards that depict some common animals and plant types from the Pacific Northwest ecosystem. Use the cards to build models and answer questions as directed on this worksheet. After building a food chain or food web with the cards, record your version by writing the organism names in the appropriate spaces on the worksheet and connecting them with arrows.

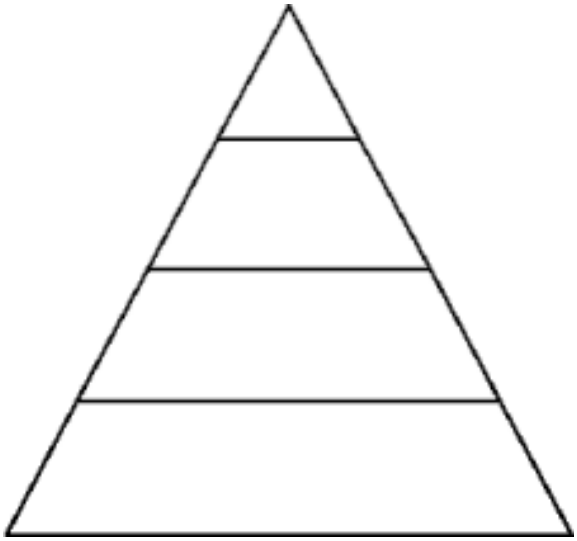
Part 1: Creating a Food Chain and Energy Pyramid

Using the organism cards, sort them into two piles that represent producers and consumers.

1. How many producers do you have? _____ How many consumers do you have? _____

2. Select four cards to create a food chain, starting with a producer. The ***sea otter*** and ***kelp*** MUST be included.

Draw your food chain in the area below. Label the trophic level of each organism in your food chain as follows: *producer, primary consumer, secondary consumer, and tertiary consumer*. Use species names and arrows in the right direction to illustrate energy flow.



3. Place the organisms from your original food chain on the pyramid provided at the right.

4. Using the rule of 10% in energy transfer, record the species names for each trophic level and the amount of energy available at that level if your producer level had 3,500,000 kilocalories of energy/area.

5. In one or two complete sentences, describe how the available energy in the marine ecosystem of the Pacific Northwest could be different than that of the African savanna.

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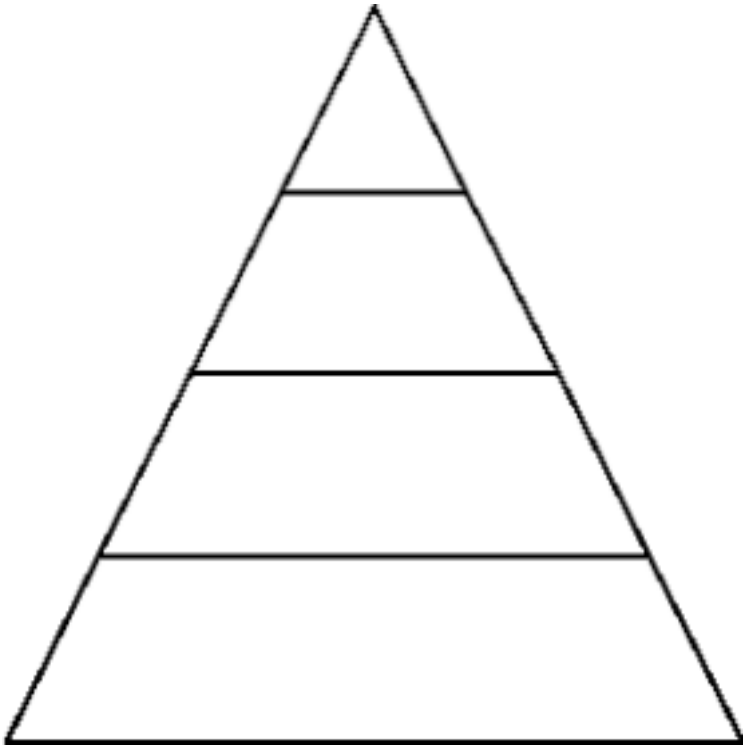
Part 2: Modifying the Food Web and Energy Pyramid

Complete some research on your assigned ecosystem in the Pacific Northwest. Determine which of the species on the cards live in your specific system which may involve you searching for 'distribution maps.' Starting with your original food chain, add at least one more producer and four more consumers to construct a food web that shows how energy flows from producers through primary consumers, secondary consumers, and tertiary consumers. *If species on the cards do NOT live in your area, you may replace them on your food web with species that do.*

6. Draw a version of your food web in the box below. My specific location is _____.

7. Modify your energy pyramid (from Questions 3 and 4) to reflect the additional organisms in your research area and new food web. Add ALL organisms to this pyramid, adding energy passed to each level.



8. Explain what happens to the available energy within each level when more organisms exist at that level.

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