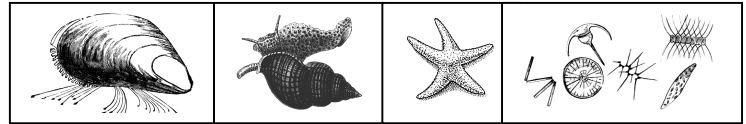


Ecology – Interactions, Energy, Nutrients, and Change in the Intertidal Community

Ecologist: _____

Date: _____ Period: _____

Activity 2 - Ecosystems and Energy



Objectives:

1. Students will be able to define the terms: trophic level, biomass, energy, herbivore, carnivore, and omnivore.
2. Students will be able to apply the 10% rule to ecological models including food webs and energy pyramids to determine the relative amount of energy available at each level in a food chain.
3. Students will be able to explain the structure of an energy pyramid in for a given ecosystem.

1. Define the following terms:

Trophic level – _____

energy – _____

biomass – _____

10% rule – _____

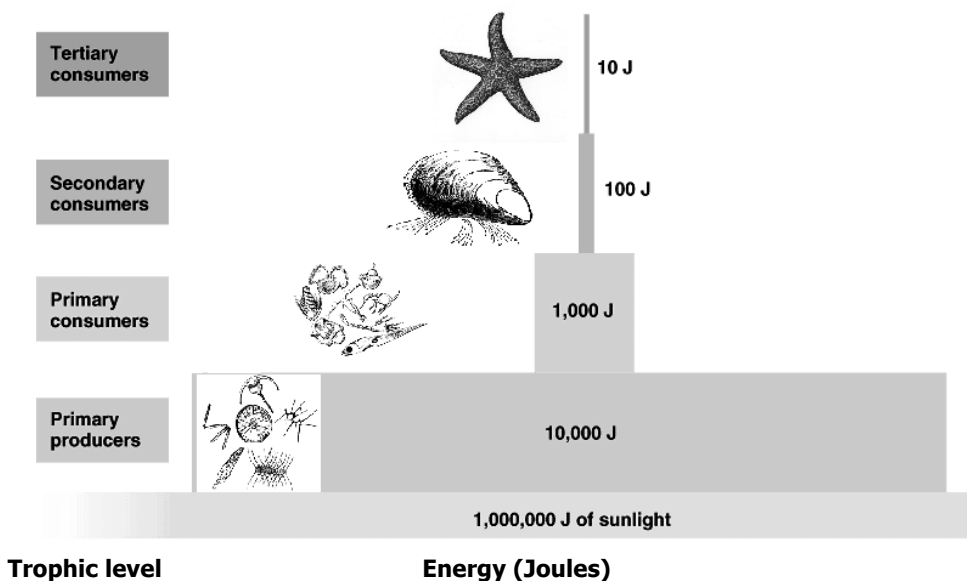
2. Match the bolded terms below to the correct definition:

- | | |
|------------------------|---|
| _____ herbivore | a. organism that feeds on both producers and animals. |
| _____ carnivore | b. organism that feeds on consumers. |
| _____ omnivore | c. organism that feeds on producers. |

3. Describing energy flow and biomass in ecosystems

Complete each of the sentences below by using the terms from the diagram.

Energy Pyramid



The trophic level that contains the most energy is the _____.

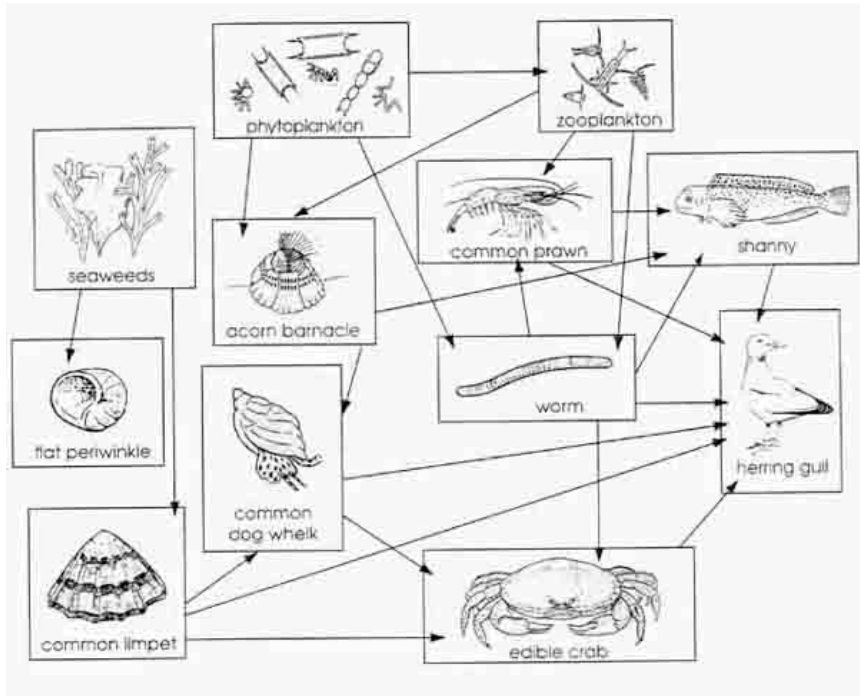
In this ecosystem, the _____ trophic level contains the least energy.

Overall, the total amount of energy _____ (increases/decreases) as the trophic level increases.

4. In the energy pyramid above, write an "H" next to the trophic level(s) occupied by herbivores, a "C" next to the trophic level(s) occupied by carnivores, and an "O" wherever an omnivore may be found.



- **Interpret** – Examine the energy pyramid. Why does the total amount of energy present in an ecosystem decrease as the number of trophic levels increases?



About 10% of the energy phytoplankton captured from the sun will be available to the acorn barnacle. For example, if there is 240,000 Joules of stored in the biomass of the phytoplankton, only 24,000 Joules of energy will be present in the biomass of the acorn barnacle. This calculation is shown in the example below.

$$240,000\text{J} \times 10\% =$$

$$240,000\text{J} \times .10 = 24,000\text{J}$$

OR just move the decimal to the left:

$$240,000. = 24,000\text{ J}$$



5. What percentage of the energy stored in seaweeds is transferred to the flat periwinkle? (**Show your work**)

6. What percentage of the energy stored in phytoplankton is transferred to the common prawn? (**Show your work**)

7. Organize each of the organisms from the food chain above into one of the categories below.

Autotroph (producer)	Heterotroph (consumer)		
	Herbivore	Omnivore	Omnivore



