Name _____ Class _____ Date _____

SECTION 22-1 REVIEW

ENERGY TRANSFER

VOCABULARY REVIEW **Distinguish between the terms in each of the following groups of terms.**

1. producer, consumer _____

2. gross primary productivity, net primary productivity _____

3. food chain, food web _____

MULTIPLE CHOICE **Write the correct letter in the blank.**

_____ 1. The term *biomass* refers to the

a. weight of the biosphere.
b. volume of plants in a community.
c. organic material in an ecosystem.
d. amount of energy produced through chemosynthesis.

_____ 2. A detritivore is an organism that

a. feeds on both producers and consumers.
b. feeds on the "garbage" of an ecosystem.
c. converts biomass into "garbage" in an ecosystem.
d. produces carbohydrates by using energy from inorganic molecules.

_____ 3. An organism's position in the sequence of energy transfers in an ecosystem is known as its

a. trophic level.
b. energy level.
c. net productivity.
d. feeding location.

_____ 4. The percentage of energy transferred from one level to another in a food chain is usually

a. greater than 90 percent.
b. about 75 percent.
c. about 50 percent.
d. less than 20 percent.

_____ 5. Compared to the lowest trophic level, the highest trophic level contains

a. more individuals.
b. less energy.
c. more producers.
d. fewer carnivores.

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SHORT ANSWER Answer the questions in the space provided.

1. Rank the following ecosystems in order of their net primary productivity, from lowest to highest: open ocean, tropical rain forest, desert, lake. _____

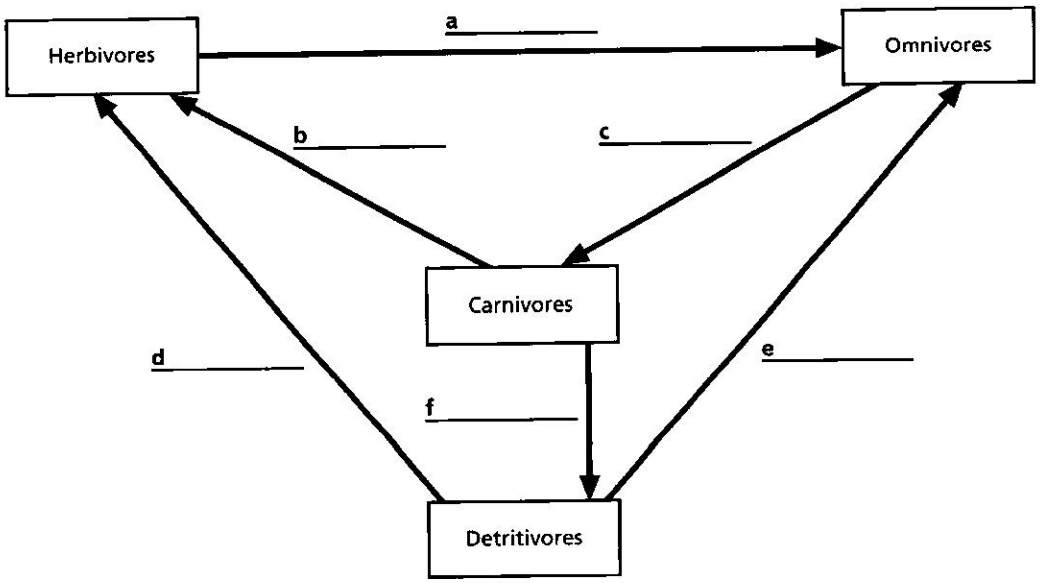
2. Why are producers the first trophic level to benefit from the activity of decomposers? _____

3. Give three reasons why energy transfer between trophic levels is not 100 percent. _____

4. Why are food chains short? _____

5. **Critical Thinking** What would happen to the energy flow through an ecosystem if the decomposers were eliminated? _____

STRUCTURES AND FUNCTIONS The diagram below shows part of a food web. Each arrow indicates energy passing from one member (the food) to another (the consumer). Only some of the indicated relationships are possible. Write yes in the spaces corresponding to the possible relationships and no in the spaces corresponding to the relationships that are not possible.



Name _____ Class _____ Date _____

SECTION 22-2 REVIEW

ECOSYSTEM RECYCLING

VOCABULARY REVIEW **Explain the relationship between the terms in each of the following groups of terms.**

1. water cycle, carbon cycle, nitrogen cycle _____

2. nitrogen fixation, nitrification, denitrification _____

MULTIPLE CHOICE **Write the correct letter in the blank.**

_____ 1. The term *ground water* refers to water that

a. exists in lakes or ponds.
b. is found in soil or in underground formations.
c. has fallen to sea level.
d. lies on the surface of the ground after a heavy rain.

_____ 2. At least 90 percent of the water that returns to the atmosphere from terrestrial ecosystems does so through

a. transpiration in plants.
b. excretion in animals.
c. sweating in animals.
d. precipitation.

_____ 3. Two sources of carbon dioxide released into the atmosphere in the carbon cycle are

a. photosynthesis and decomposition.
b. cellular respiration and photosynthesis.
c. combustion and transpiration.
d. cellular respiration and combustion.

_____ 4. Two components of the nitrogen cycle that produce ammonia are

a. nitrification and denitrification.
b. nitrogen fixation and nitrification.
c. nitrogen fixation and ammonification.
d. ammonification and denitrification.

_____ 5. Animals obtain nitrogen

a. through a mutualistic relationship with nitrogen-fixing bacteria.
b. from the proteins and nucleic acids in the organisms they consume.
c. by absorbing nitrates and ammonia from the soil.
d. by absorbing nitrogen gas from the atmosphere.

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SHORT ANSWER Answer the questions in the space provided.

1. Name three processes in the water cycle, and state whether each process removes water from the atmosphere or returns it to the atmosphere. _____

2. Describe the cycling of carbon in the carbon cycle. _____

3. Where are nitrogen-fixing bacteria found? How do these bacteria benefit plants? _____

4. **Critical Thinking** If a crop, such as corn, is grown in the same field year after year, a nitrogen-containing fertilizer must be added to the soil each time a new crop is planted. Why isn't a single application of fertilizer sufficient? _____

STRUCTURES AND FUNCTIONS The diagram below represents the effect of the water, carbon, and nitrogen cycles on the life of a plant. Identify the process indicated in the three cycles.