Name _____ Class _____ Date _____

3.1 What Is Ecology? Studying Our Living Planet

1. What is ecology?

_____

2. Label each level of organization on the diagram below.
3. What is the difference between a population and a community? _____

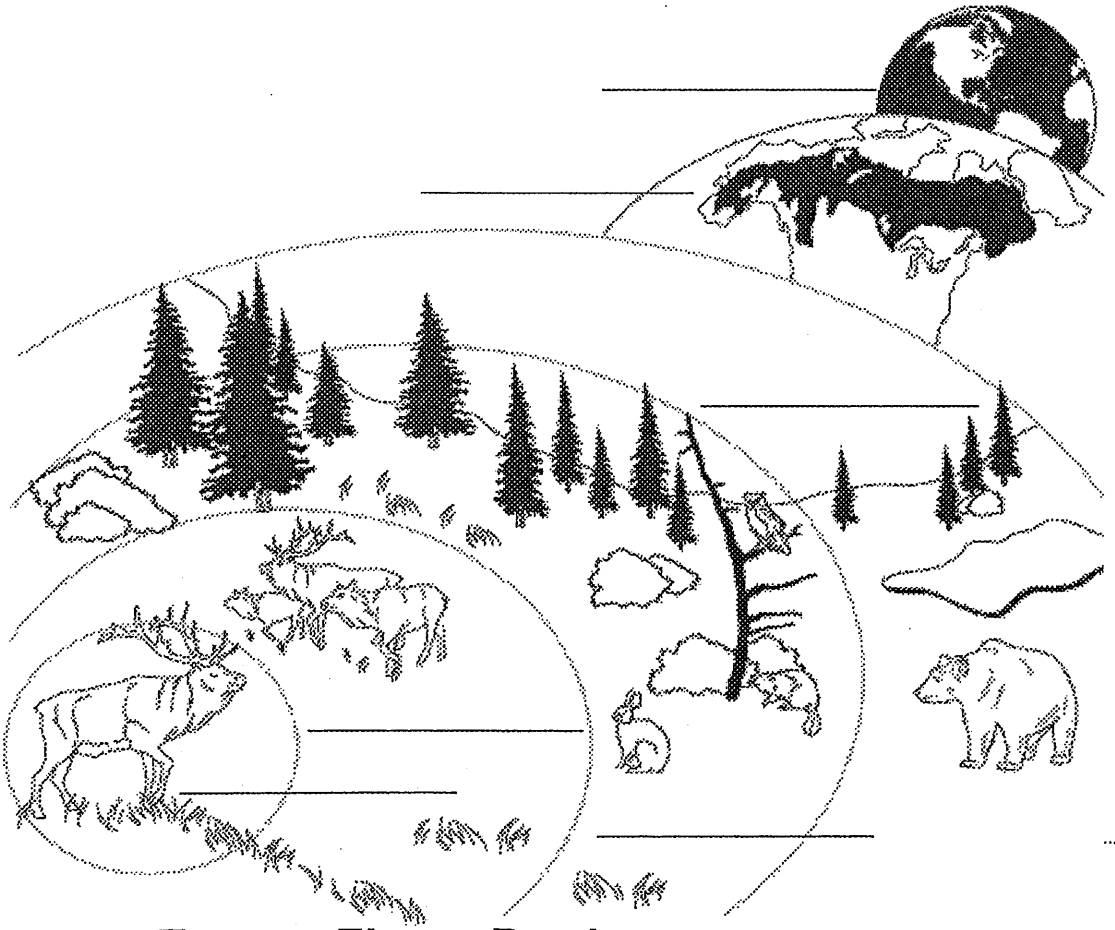
_____

4. What does the ecosystem contain that a community does not?

_____

5. Explain the relationship between ecosystems and biomes.

_____



3-2 : Energy Flow: Producers

1. Can some organisms survive without energy from the sun? Explain your answer.

_____

2. Can organisms create their own energy? Explain your answer. _____

_____

3. What is another name for producer? _____ consumer? _____

3-2 : Energy Flow: Consumers

4. Complete the table about types of heterotrophs.

Types of Heterotrophs		
Type	**Definition**	**Examples**
Herbivore		cows, rabbits
	Heterotroph that eats animals	
Omnivore		humans, bears, pigs
Detritivore		
Decomposer		
	Heterotroph that consumes the carcasses of dead animals but does not typically kill them itself	

5. What is a consumer?

_____

6. How would you categorize a consumer that usually catches and eats prey, but also eats dead animal carcasses? _____

3.3 Energy Flow in Ecosystems

Trophic Levels and Ecological Pyramids

Write True or False on the line provided.

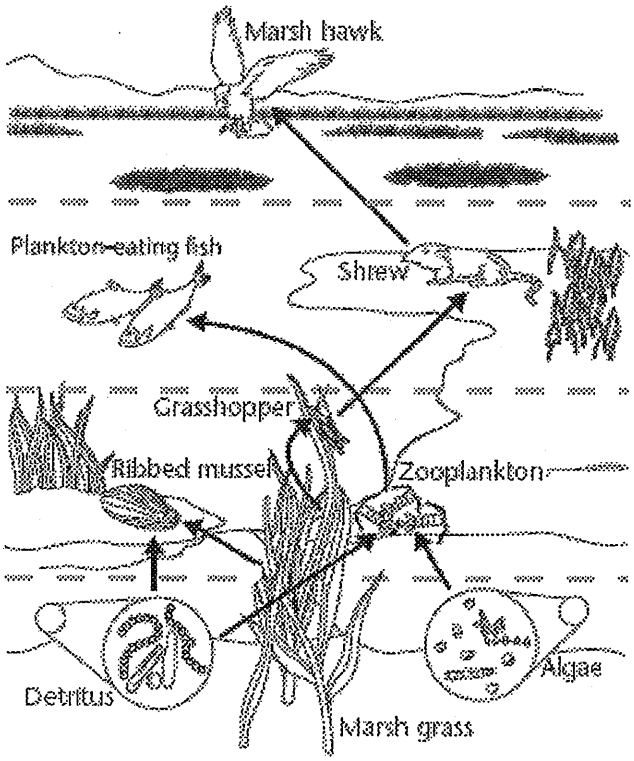
_____ **6.** Primary consumers always make up the first trophic level in a food web.

_____ **7.** Ecological pyramids show the relative amount of energy or matter contained within each trophic level in a given food web.

_____ **8.** On average, about 50 percent of the energy available within one trophic level is transferred to the next trophic level.

_____ **9.** The more levels that exist between a producer and a given consumer, the larger the percentage of the original energy from producers is available to that consumer.

Use the diagram to answer Questions 10–18.



Match the organism with its trophic level. A trophic level may be used more than once.

Organism	**Trophic Level**
_____ **10.** algae	
_____ **11.** grasshopper	**A.** primary producer
_____ **12.** marsh grass	**B.** first-level consumer
_____ **13.** marsh hawk	**C.** second-level consumer
_____ **14.** plankton-eating fish	**D.** third-level consumer
_____ **15.** ribbed mussel	
_____ **16.** shrew	
_____ **17.** zooplankton	

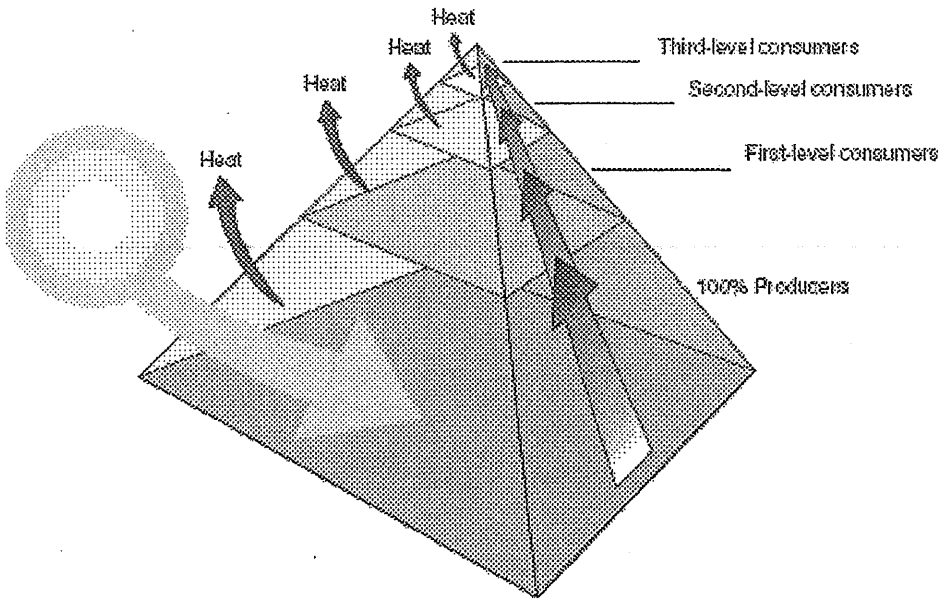
18. a. In the ecosystem pictured above, what might happen to shrews if the population of hawks declined?

b. How could that affect the population of grasshoppers?

c. How might the change in the grasshopper population affect the marsh grass? How might the ribbed mussel be affected?

d. When a population in an ecosystem changes, is the affect on the rest of the ecosystem simple or complex? Defend your evidence using information from the web (and questions) above).

19. Complete the energy pyramid by writing the source of the energy for the food web and how much energy is available to first-, second-, and third-level consumers.



For Questions 20–22, complete each statement by writing the correct word or words.

20. A pyramid of _____ illustrates the relative amount of living organic matter

available at each trophic level in an ecosystem.

21. A pyramid of _____ shows the relative numbers of individual organisms at the trophic levels in an ecosystem.

22. A pyramid of _____ shows the relative amounts of energy available at the trophic levels of a food chain or food web

23. What trophic level is a secondary consumer on?

24. Explain the 10% rule in your own words.

25. Do vegetarians require more or less land mass to survive (think of the energy pyramid!) Defend your answer!