CP Biology Name_____Date_____Period_____

HOMEWORK PACKET

UNIT 1B: Introduction to Ecology

Name _____ Class _____ Date _____

3.1 What Is Ecology?

Studying Our Living Planet

1. What is ecology?

_____

_____

_____

2. What does the biosphere contain?

_____

_____

3. How are human economics and ecology linked?

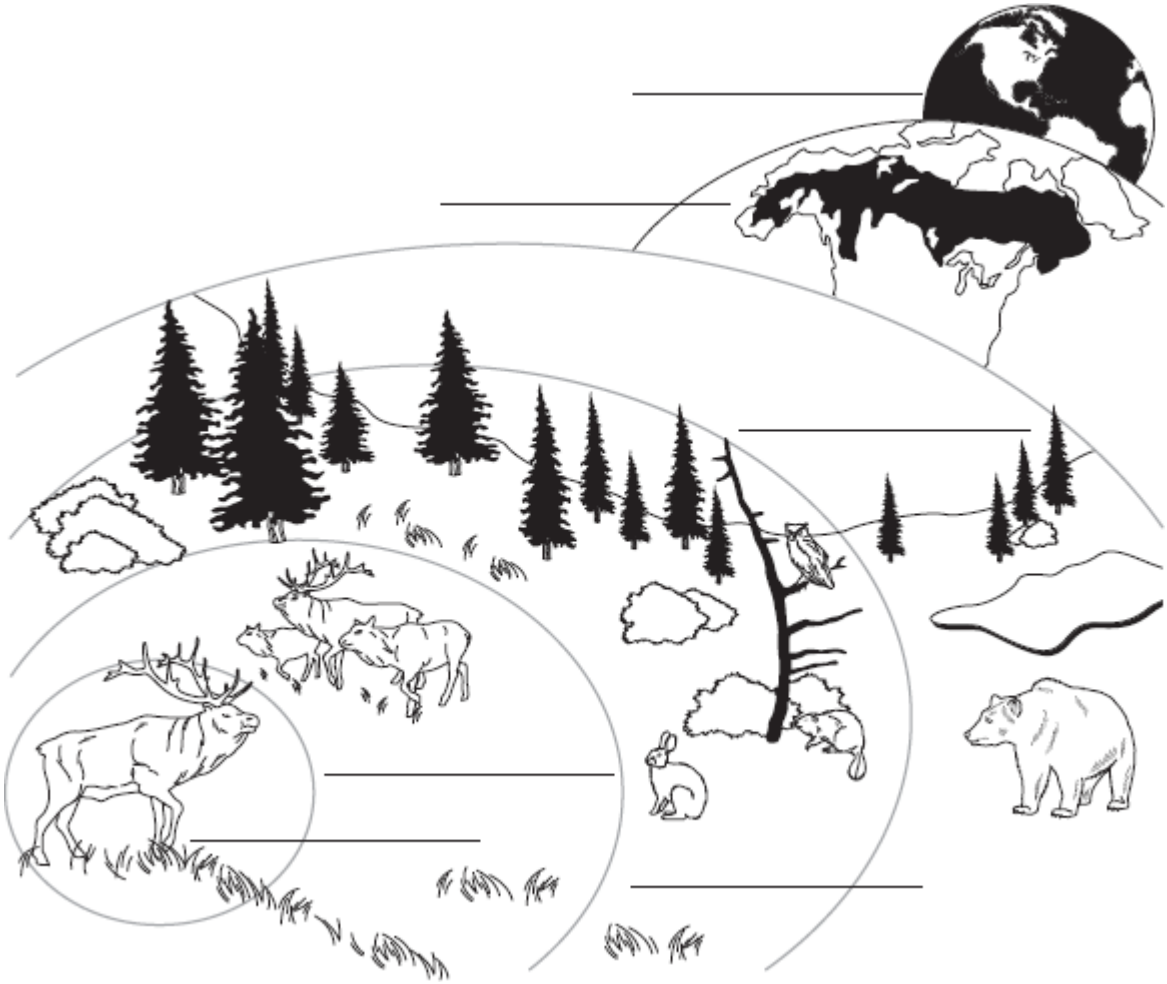
_____

_____

_____

_____

Use the diagram to answer Questions 4–5



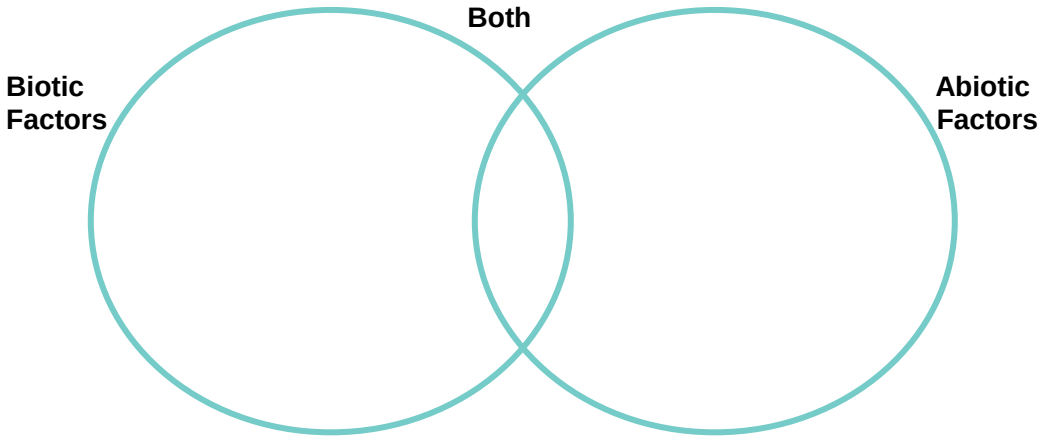
4. Label each level of organization on the diagram.

5. Explain the relationship between ecosystems and biomes.

Biotic and Abiotic Factors

6. Use the terms in the box to fill in the Venn diagram. List parts of the environment that consist of biotic factors, abiotic factors, and some components that are a mixture of both.

air	**heat**	**precipitation**
animals	**mushrooms**	**soil**
bacteria	**plants**	**sunlight**



Ecological Methods

7. Why might an ecologist set up an artificial environment in a laboratory?

8. Why are many ecological phenomena difficult to study?

9. Why do ecologists make models?

3.2 Energy, Producers, and Consumers

Primary Producers

1. What do autotrophs do during photosynthesis?

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

_____

_____

_____

_____

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

_____

_____

_____

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

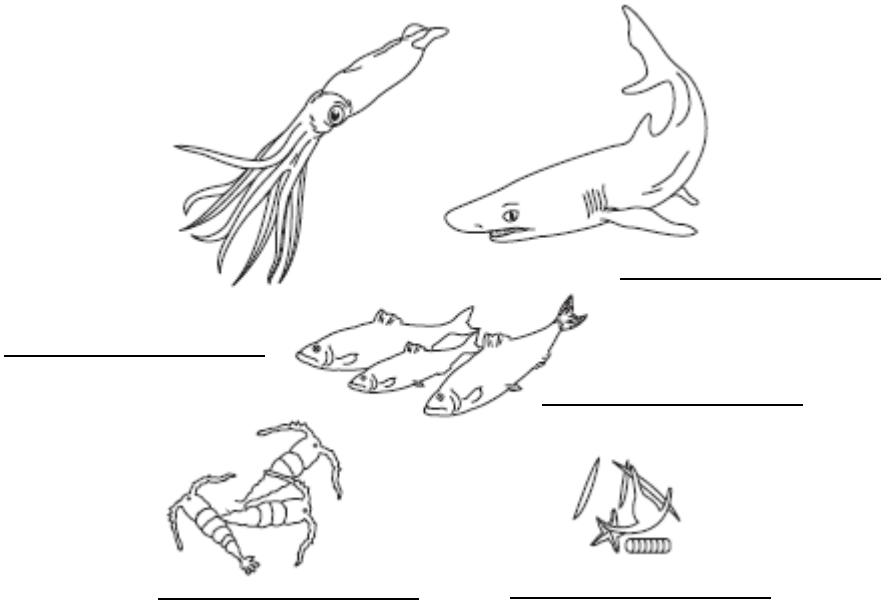
Food Chains and Food Webs

1. Complete the table about feeding relationships.

Feeding Relationships	
Relationship	**Description**
Food Chain	
Food Web	

Use the food chain to answer Questions 2–4.

2. Draw arrows between the organisms to show how energy moves through this food chain. Write *producer*, *herbivore*, or *carnivore* under each organism.



3. Explain how energy flows through this food chain. _____

_____

_____

_____

4. What would happen to this food chain if a disturbance caused a serious decline in the shark population? _____

_____

_____

_____

5. **VISUAL ANALOGY** What role does energy play in the diagram, and how is it represented? _____

_____

_____

_____

Trophic Levels and Ecological Pyramids

Write True or False on the line provided.

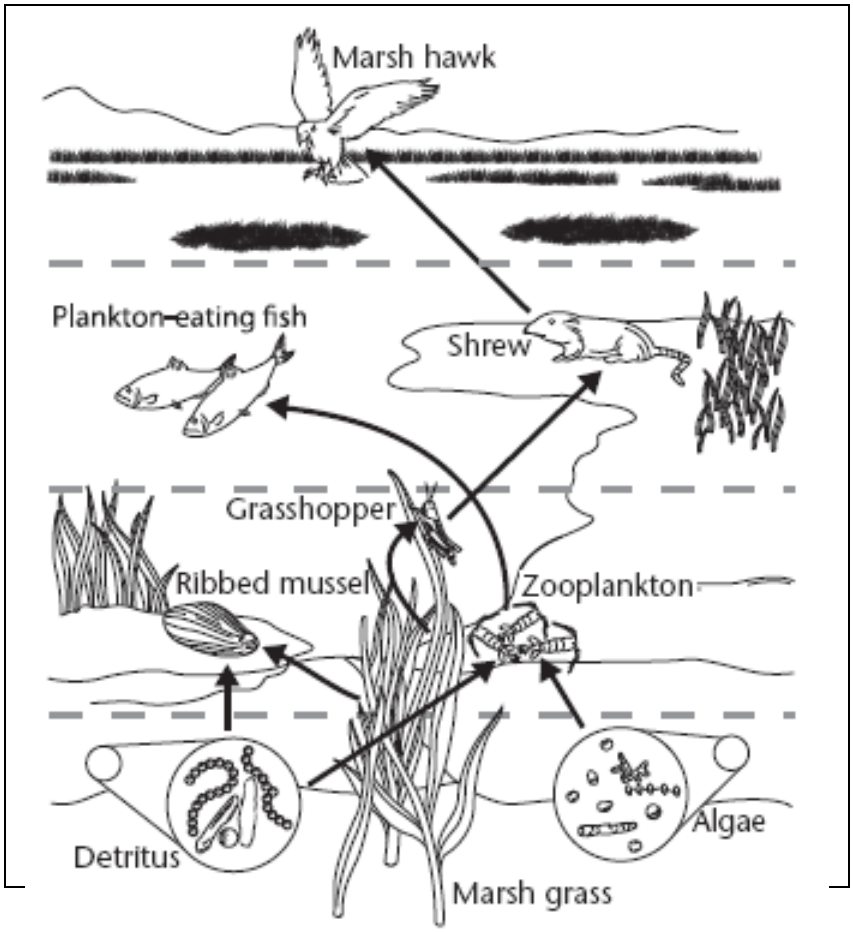
_____ **6.** Primary consumers always make up the first trophic level in a food web.

_____ **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 10–17. Match the organism with its trophic level. A trophic level may be used more than once.



Organism

_____ **10.** algae

_____ **11.** grasshopper

_____ **12.** marsh grass

_____ **13.** marsh hawk

_____ **14.** plankton-eating fish

_____ **15.** ribbed mussel

_____ **16.** shrew

_____ **17.** zooplankton

Match the term with its definition.

Term	Definition
_____ **1.** nutrient	**A.** all the organisms in one area and their physical environment
_____ **2.** chemosynthesis	**B.** a process in which producers use chemical energy to make carbohydrates
_____ **3.** consumer	**C.** an organism that feeds on other organisms
_____ **4.** ecosystem	**D.** a chemical substance that an organism needs to survive
_____ **5.** photosynthesis	**E.** an organism that uses chemical or light energy to produce its own food supply
_____ **6.** ecology	**F.** the study of the biosphere
_____ **7.** primary producer	**G.** the portion of Earth and its atmosphere that contains organisms
_____ **8.** biosphere	**H.** a process in which producers use light energy to make carbohydrates

For Questions 9–12, complete the analogies.

9. omnivore : human :: carnivore : _____

10. detritivore : earthworm :: herbivore : _____

11. autotroph : heterotroph :: phytoplankton : _____

12. biotic factor : elephant :: abiotic factor : _____

13. What is the difference between a food chain and a food web?

_____

_____

_____

Complete each statement by writing the correct word or words.

14. There are several hundred squirrels living in an oak forest. The squirrels make up a(n) _____.

15. Fungi and some kinds of bacteria are _____ that obtain nutrients by chemically breaking down organic matter.

16. Ecologists measure _____ in grams of organic matter per unit area.

17. In a process known as _____, some types of soil bacteria obtain energy by converting nitrates into nitrogen gas.

4.2 Niches and Community Interactions

The Niche

1. What is a niche?

_____

_____

2. Give an example of resources a squirrel might need.

_____

_____

3. Three different warbler species live in the same tree. One species feeds at the top of the tree, the second species feeds in the middle part of the tree, and the third species feeds at the bottom of the tree. Do all three species occupy the same niche? Explain.

_____

_____

_____

Competition

For Questions 4–8, write True if the statement is true. If the statement is false, change the underlined word or words to make the statement true.

_____ **4.** Competition occurs when organisms attempt to use the same resources.

_____ **5.** Competition between members of the same species is known as interspecific competition.

_____ **6.** The competitive exclusion principle states that no two organisms can occupy exactly the same niche in exactly the same habitat at exactly the same time.

_____ **7.** If two species of bacteria are grown in the same culture, one species will always outcompete the other.

_____ **8.** Members of the same species tend to divide resources instead of competing over them.

Predation, Herbivory, and Keystone Species

Write the letter of the correct answer on the line at the left.

_____ **9.** A lion eating a zebra is an example of

A. herbivory. **C.** predation.

B. habitat destruction. **D.** a keystone species.

_____ **10.** A cow eating grass is an example of

A. herbivory. **C.** habitat destruction.

B. predation. **D.** a keystone species.

_____ **11.** A keystone species is one that

A. eats a mixture of plants and animals.

B. is introduced into a community after a major disturbance.

C. causes the amount of diversity in a community to decrease.

D. helps to stabilize the populations of other species in the community.

4.4 Biomes

The Major Biomes

For Questions 1–4, complete each statement by writing the correct word or words.

1. The side of a mountain range that faces the wind often receives more _____ than the downwind side of the same range.

2. A(n) _____ is a group of terrestrial communities that covers a large area and is characterized by certain soil and _____ conditions and particular types of plants and animals.

3. Organisms within each biome can be characterized by _____ that enable them to live and reproduce successfully in the environment.

4. In a tropical rain forest, the layer formed by the leafy tops of tall trees is called the _____ and the layer of shorter trees and vines is called the _____.