

SECTION
13.1 | ECOLOGISTS STUDY RELATIONSHIPS
Study Guide

KEY CONCEPT

Ecology is the study of the relationships among organisms and their environment.

VOCABULARY

ecology	ecosystem
community	biome

MAIN IDEA: Ecologists study environments at different levels of organization.

Write a description of each level of organization in the table. Also, provide an example for each level.

Level	Description	Example
1. organism		
2. population		
3. community		
4. ecosystem		
5. biome		

MAIN IDEA: Ecological research methods include observation, experimentation, and modeling.

6. What is observation?

7. What is the difference between direct and indirect surveys?

Section 13.1 STUDY GUIDE CONTINUED

8. Complete the following table with a benefit and drawback of conducting an experiment in the laboratory compared with conducting an experiment in the field.

Experiment	Benefit	Drawback
Laboratory		
Field		

9. When might a scientist use a model as a research method?

Vocabulary Check

10. What is ecology?

11. Of the three terms, *biome*, *community*, and *ecosystem*, which term contains the other two?

SECTION
13.2 | BIOTIC AND ABIOTIC FACTORS
Study Guide

KEY CONCEPT

Every ecosystem includes both living and nonliving factors.

VOCABULARY

biotic	biodiversity
abiotic	keystone species

MAIN IDEA: An ecosystem includes both biotic and abiotic factors.

Use a word from the box below to complete the following sentences.

abiotic	animals	biotic
living	moisture	nonliving
plants	temperature	wind

- All ecosystems are made up of _____ and _____ components.
- _____ factors are living things, such as _____ or _____.
- _____ factors are nonliving things, such as _____, _____, or _____.

MAIN IDEA: Changing one factor in an ecosystem can affect many other factors.

- Describe what biodiversity means in your own words.

- What is the term for an organism that has an unusually large effect on its ecosystem?

- List a few reasons why a beaver is an example of a keystone species.

Section 13.2 STUDY GUIDE CONTINUED


Vocabulary Check

7. What is the difference between a biotic and an abiotic factor?

8. Take another look at the Visual Vocab on page 403. In architecture, a keystone is the stone at the center of an arch that holds the arch together. How does this definition relate to a keystone species?

Be Creative

In the box below, sketch a simple ecosystem and label the abiotic and biotic factors.



SECTION
13.3 | ENERGY IN ECOSYSTEMS
Study Guide

KEY CONCEPT

Life in an ecosystem requires a source of energy.

VOCABULARY

producer	heterotroph
autotroph	chemosynthesis
consumer	

MAIN IDEA: Producers provide energy for other organisms in an ecosystem.

Complete the following sentences with the correct term.

autotrophs	eating	nonliving
consumers	heterotrophs	producers

- _____ are organisms that get their energy from _____ resources, meaning they make their own food. These organisms are also called _____.
- _____ are organisms that get their energy by _____ other organisms. These organisms are also called _____.

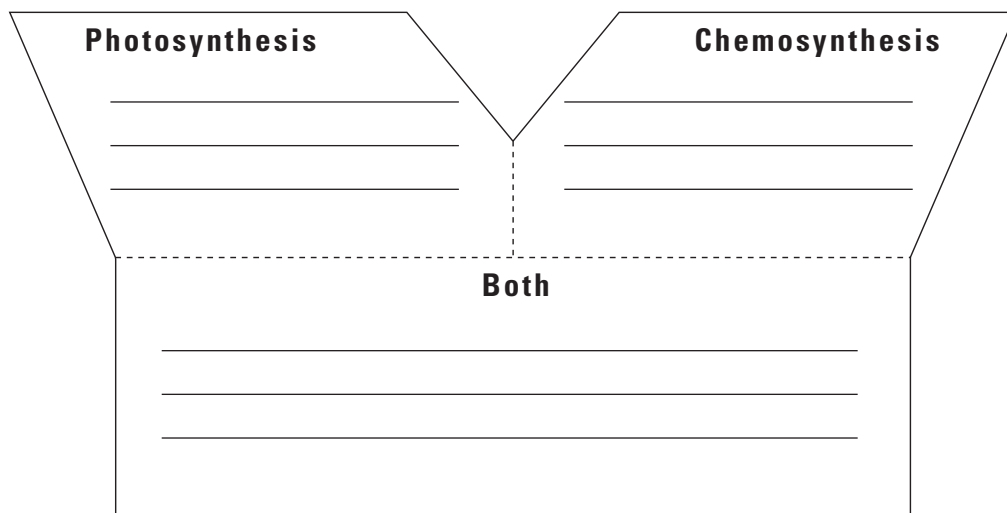
- Why are producers so important to an ecosystem?

- Why is the Sun important to both producers and consumers?

Section 13.3 STUDY GUIDE CONTINUED

MAIN IDEA: Almost all producers obtain energy from sunlight.

5. Complete the following Y-diagram to outline the similarities and differences between photosynthesis and chemosynthesis.

**Vocabulary Check**

6.

Word Part	Meaning
auto-	self
hetero-	other
-troph	nourishment

Use the above word origins to explain the difference between an autotroph and a heterotroph.

7. The prefix *photo-* means “light” while the prefix *chemo-* means “chemical.” How do these word origins relate to the difference between photosynthesis and chemosynthesis?

8. What is the difference between a consumer and a producer?

SECTION
13.4 | FOOD CHAINS AND FOOD WEBS
Study Guide

KEY CONCEPT

Food chains and food webs model the flow of energy in an ecosystem.

VOCABULARY

food chain	decomposer
herbivore	specialist
carnivore	generalist
omnivore	trophic level
detritivore	food web

MAIN IDEA: A food chain is a model that shows a sequence of feeding relationships.

Complete the following sentence with the correct terms.

1. A food chain follows the connection between one _____ and a single chain of _____ within an _____.

Choose the correct term from the box below to fit each description.

carnivore	herbivore	secondary consumer
decomposer	omnivore	tertiary consumer
detritivore	primary consumer	trophic levels

2. I eat only plants. I am a(n) _____.
3. I eat only other animals. I am a(n) _____.
4. I eat both plants and animals. I am a(n) _____.
5. I eat dead organic matter. I am a(n) _____.
6. I break down organic matter into simpler compounds. I am a(n) _____.
7. I am the first consumer above the producer level. I am a(n) _____.
8. I am a carnivore that eats herbivores. I am a(n) _____.
9. I am a carnivore that eats other carnivores. I am a(n) _____.
10. The levels of nourishment in a food chain are called _____.

Section 13.4 STUDY GUIDE CONTINUED

MAIN IDEA: A food web shows a complex network of feeding relationships.**11.** How is a food web different from a food chain?

12. What happens to energy at each link in a food web?

13. What type of organism provides the base of a food web?

Vocabulary Check**14.** Use your knowledge of the words *special* and *general* to explain the diets of a specialist and a generalist.

15.

Word Part	Meaning
herba	vegetation
carnus	flesh
omnis	all

Use the word origins to explain the diets of each of the following consumers: herbivores, carnivores, and omnivores.

SECTION
13.5 | CYCLING OF MATTER
Study Guide

KEY CONCEPT

Matter cycles in and out of an ecosystem.

VOCABULARY

hydrologic cycle
biogeochemical cycle
nitrogen fixation

MAIN IDEA: Water cycles through the environment.

Fill in the chart with a description of each process that describes how water moves through an ecosystem in the hydrologic cycle.

Process	Description
1. precipitation	
2. evaporation	
3. transpiration	
4. condensation	

MAIN IDEA: Elements essential for life also cycle through ecosystems.

Complete the following sentences with the proper terms.

- Plants, animals, and most other organisms need _____ for cellular _____.
- Oxygen is released as a waste product by plants during the process of _____. Animals take in this oxygen and release it as _____ during the process of _____.
- In the carbon cycle, plants use energy from the Sun to convert _____ from the air into organic material that becomes a part of the plant's structure.

Name _____

Period _____

Date _____

Section 13.5 STUDY GUIDE CONTINUED

- 8.** Carbon is released to the atmosphere as carbon dioxide when you breathe during the process of _____ or through the _____ of dead organisms.
- 9.** _____, or the burning of fossil fuels, also adds carbon dioxide to the atmosphere.
- 10.** What is nitrogen fixation?

- 11.** List five steps that occur during the phosphorus cycle.

Vocabulary Check

Use the following word origins to answer the questions below.

Word Part	Meaning
bio-	life
chem-	chemical
geo-	earth
hydro-	water

- 12.** What is a biogeochemical cycle?

- 13.** What is the hydrologic cycle?

SECTION
13.6 | PYRAMID MODELS
Study Guide

KEY CONCEPT

Pyramids model the distribution of energy and matter in an ecosystem.

VOCABULARY

biomass
energy pyramid

MAIN IDEA: An energy pyramid shows the distribution of energy among trophic levels.

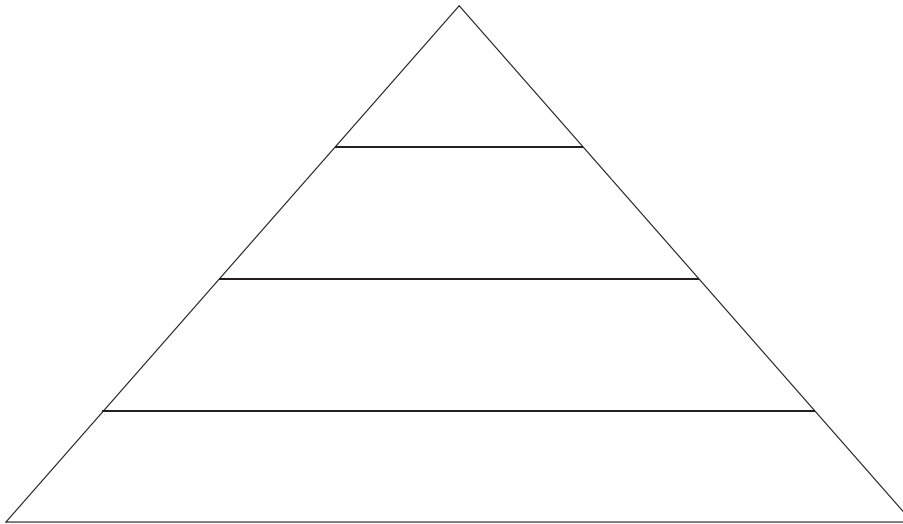
Complete the following sentences with the correct terms.

biomass

heat

waste

1. The measure of the total dry mass of organisms in a given area is called _____.
2. When a consumer incorporates the biomass of a producer into its own biomass, a large amount of energy is lost as _____ and _____.
3. Label the four tiers of the energy pyramid with the correct trophic level (producers, primary consumers, secondary consumers, tertiary consumers).



Section 13.6 STUDY GUIDE CONTINUED

MAIN IDEA: Other pyramid models illustrate an ecosystem's biomass and distribution of organisms.

Write a description of each pyramid model.

Model	Description
4. energy pyramid	
5. biomass pyramid	
6. pyramid of numbers	

Vocabulary Check

7. What is biomass?

Make an Energy Pyramid

8. Choose an ecosystem. Research what types of plants and animals live in your chosen ecosystem. Draw an energy pyramid that might exist within that ecosystem.

