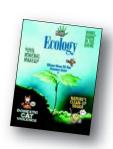


Teacher's Guide Ecology



Dear Educator,

xplore the world around you and find out how you can impact the Earth and your environment! With KIDS DISCOVER Ecology, your young ecologists will learn about the fascinating topics at right.

This Teacher's Guide is filled with activity ideas and blackline masters to help your students enjoy and learn more from *Ecology*. Select or adapt the activities that suit your students' needs best.

Thank you for making KIDS DISCOVER a part of your classroom.

Sincerely,

KIDS DISCOVER

P.S. We would love to hear from you! E-mail your comments and ideas to teachers@kidsdiscover.com

Meeting the Standards

- ✓ Life Science
- ✓ Earth and Space Science
- —National Science Education Standards
- ✓ Visit <u>www.kidsdiscover.com/standards</u> to find out more about how KIDS **DISCOVER** meets state and national standards.

PAGES

WHAT'S IN ECOLOGY

2-3 Look Around

A colorful diagram of six ways of looking at our planet

4-5 Our World

A map of the ten biomes of the world

6-7 Who's Eating Whom?

The food chain, food web, and relationships in nature

8-9 Life Cycles

The water cycle, carbon cycle, greenhouse effect, and global warming

10–11 Going... Going... GONE!

An up-close photo of an endangered African elephant

12–13 Balance of Nature

Succession, adaptation, biodiversity, and how nature renews itself

14-15 A River of Fire

Pollution, urban sprawl, and how humans impact the earth

16-17 Ecologists to the Rescue

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The peregrine falcon, deformed frogs, and Rachel Carson plus solar cars!

18–19 Student Activities

How to be an amateur ecologist, plus a fact-filled crossword, biome map match, and resources

IN THIS TEACHER'S GUIDE

2 Prereading Activities

3 Get Set to Read (Anticipation Guide)



4 Discussion and Writing Questions

5-6 It's in the Reading (Reading Comprehension) Backline Master



7 Everything Visual (Graphic Skills)

Blackline Master

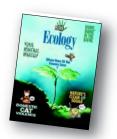


8 Cross-Curricular Extensions

9-12 Answer Keys to Blackline Masters



PREREADING ACTIVITIES



Defore distributing KIDS DISCOVER *Ecology*, activate students' prior knowledge and set a purpose for reading with these activities.

Discussion

o get students thinking about how this topic relates to their interests and lives, ask:

- **✓** What are some ways people can and do help the environment?
- **✓** What are some ways people hurt the environment?

Concept map



Explain to students that they will be reading **Ecology**. Ask: What are some words that are related to ecology? List students' responses on the board. (See box below for some terms they may suggest.) After creating a list, ask students to

group the words into categories, such as Life Cycles or **Environmental Problems.** Create a concept map by writing *Ecology* on the board and circling it. Write the categories around the circle and draw lines between the ideas to show connections. Then write the words from the list around the appropriate categories. Encourage students to add more words to the concept map as they read *Ecology*.

KEY TERMS

- environment
- ✓ greenhouse effect
- ✓ global warming
- ✓ biosphere
- ✓ biome
- ecosystem

- community
- population
- niche
- ✓ food chain
- ✓ food web
- water cycle

Get Set to Read (Anticipation Guide) Blackline Master



opy and distribute the **Get Set to Read** blackline master (page 3 of this Teacher's Guide). Explain to students that this **Anticipation Guide** will help them find out what they know and what misconceptions they have about the topic. Get Set to Read is a list of statements—some true, some false. Ask students to write whether they think each statement is true or false in the Before **Reading** column. Be sure to tell students that it is not a test and they will not be graded on their answers. The activity can be completed in a variety of ways for differentiated instruction:

- ♦ Have students work on their own or in small groups to complete the entire page.
- ◆ Assign pairs of students to focus on two statements and to become "experts" on these topics.
- ◆ Ask students to complete the Before Reading column on their own, and then tabulate the class's answers on the chalkboard, on an overhead transparency, or on your classroom computer.
- ◆ Review the statements orally with the entire class.

If you predict that students will need assistance finding the answers, complete the Page Number column before copying Get Set to Read.

Preview

istribute *Ecology* and model how to preview it. Examine titles, headings, words in boldface type, pictures, charts, and captions. Then have students add new information to the Concept Map. If students will only be reading a few pages at one sitting, preview only the selected pages.

BE WORD WISE WITH POWER VOCABULARY!

ou have exclusive access to additional resources including Power Vocabulary blackline masters for every available KIDS DISCOVER title! These activities introduce students to 15 specialized and general-use vocabulary words from each KiDS DISCOVER title. Working with both types of words helps students develop vocabulary, improve comprehension, and read fluently. Follow the links from your Teacher's Toolbox CD-ROM and find your title to access these valuable resources:

- Vocabulary cards
- ◆ Crossword puzzle
- ◆ Word find
- ◆ Matching
- ◆ Cloze sentences
- ♦ Dictionary list

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Name	Date

Get Set to Read

What do you know about ecology? In "Before Reading," write *true* if you think the statement is true. Write *false* if you think the statement is not true. Then read KIDS DISCOVER *Ecology*. Check back to find out if you were correct. Write the correct answer and the page number where you found it.

CHALLENGE: Rewrite each false sentence in a way that makes it true.

Before Reading		After Reading	Page Number
	1. Ecology is the study of living things and their environment.	• • • • • • • • • • • • • • • • • • •	•
	2. Tundra is an example of a water biome.	• • • • • • • • • • • • • • • • • • •	•
	3. Plants make their own food.	•	• •
	4. Carbon dioxide helps to trap the Sun's energy.	• • • • • • • • • • • • • • • • • • •	•
	Humans have caused the extinction of some species of plants and animals.	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •
	6. About 99 percent of the species of plants and animals that ever lived on Earth are still alive.	• • • • • • • • • • • • • • • • • • •	•
	7. In an ecosystem, more than one kind of animal has the same niche.	•	•
	8. Natural disasters, such as volca- noes, have only harmful effects.	•	• • • • • • • • • • • • • • • • • • •
	9. Human activities have little impact on other animals.	• • • • • • • • • • • • • • • • • • •	• • • • • • •
	10. The number of amphibians on Earth is increasing.	• • • • • • • • • • • • • • • • • • •	
		• • • •	•
		•	•
		•	•



DISCUSSION & WRITING QUESTIONS



Use the following questions as oral discussion starters or for journaling. For additional in-class discussion and writing questions, adapt the questions on the reading comprehension blackline masters on pages 5 and 6.

Pages 2-3

Ecologists study nature. Some measure pollution levels. Others observe animal behavior. Some educate the public about problems, such as habitat destruction. Ask:

- **✓** Would you like to be an ecologist? Why?
- ✓ What aspect of ecology would you like to study?

Pages 4-5

Pages 4 and 5 feature biomes of the world. Ask:

- ✓ Which biome do you live in?
- ✓ Which biomes have you been to? Not been to?
- ✓ In which biome would you most like to spend a vacation? Why
- ✓ In which biome do you think there would be the most interesting plants and animals?
- ✓ Which biome do you think would be the hardest for you to live in? Why?

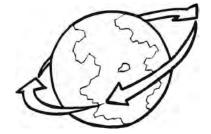
Pages 6-7

- ✓ Does your community have any problems with overpopulation or diminishing populations of local plants or animals, such as deer, Japanese beetles, or choking tree vines?
- ✓ How does overpopulation or diminishing populations affect other local plants and animals?

Pages 8-9

Some scientists predict that global warming will cause disasters, such as ice sheets melting and coastal cities flooding. Global warming is caused by, among other things, pollution. Ask:

- Are you concerned about global warming?
- ✓ What can you do about global warming?



Pages 10-11

On pages 10 and 11, there is a photograph of an elephant and impala. Ask:

- ✓ Has anyone seen these animals in real life? Where?
- ✓ How would you feel if they became extinct?
- ✓ Is there anything you could do to help endangered animals survive? What could you do?

Pages 12-13

Fires, volcanic eruptions, and other disasters alter nature. Ask:

- Has anyone witnessed a natural disaster, or has anyone visited a place that experienced one?
- ✓ How did that place look?
- Since the disaster, what types of changes in the plants and animals have you seen there?

HELPING HAND

Use KIDS DISCOVER to model

how to summarize ideas by writing main points on sticky notes and attaching them to the pages.

Pages 14-15

Some people live in cities, where there are few trees and animals. Others live in more rural areas, where there may be many trees and wild animals. Ask:

- ✓ If you live in a city, what do you miss by not living in the country?
- ✓ If you live in the country, what do you miss by not living in the city?
- ✓ What advantages are there to living in each place?

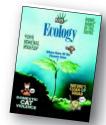
Pages 16-17

- Why do you think people are concerned about deformed frogs and the shrinking population of amphibians?
- ✓ Why do you think people are concerned about saving endangered animals, such as the peregrine falcon? ❖

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It's in the Reading

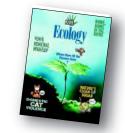
After reading KIDS DISCOVER <i>Ecology</i> , choose the best answer for each questicircle.	on. Fill in the
Find your answers on the pages shown in the book icon next to each question.	
 1. The term ecology comes from Greek words meaning A. the science of living things B. the study of a place to live C. the science of ecosystems D. the study of natural history 	23
 2. Cold winters, hot summers, and few trees are characteristics of A. temperate grasslands B. deserts C. chaparral D. tundra 	4 5
 3. One way mushrooms differ from plants is that mushrooms A. do not move around B. are decomposers C. make their own food D. do not grow 	6 7
 4. The honey guide bird and ratel work together to find food. In this way, the honey guide bird gets the beeswax it eats and the ratel gets the honey it eats. Their relationship is an example of A. parasite relationship B. decomposition C. mutualism D. commensalism 	6 7
 5. Carbon dioxide is taken in by A. rotting plants and animals B. burning fuels C. living animals D. living plants 	89



It's in the Reading (continued)

 6. Homo sapiens is the species name for A. plankton B. impalas C. humans D. African elephants 	10 11
 7. In an ecosystem, cheetahs may be part of the same as lions. A. niche B. population C. community D. species 	12 13
 8. In the process of succession, the first plants to return to a destroyed area are A. grasses and weeds B. bushes C. small trees D. large trees 	12 13
 9. Farmland is being replaced by housing and businesses because A. people need less food B. farming the land is less profitable than providing housing and businesses C. more people need larger homes D. the land is no longer good for farming 	14 15
10. What's your opinion? Are people's activities increasing the likelihood of global warming? Can people do something to prevent global warming? What can you as an individual do?	





Name	Date

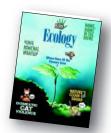
Everything Visual

Maps are useful visuals that may show countries, mountains, roadways, or land features. Together with map keys, they provide information about an area. Study the map of the continents on pages 4–5 of KIDS DISCOVER *Ecology*. Find the names of the continents on another map. Then answer the questions.

What is the title of the map?
What information about the map does the map key provide?
Which continents on the map do not have a tundra biome?
What biomes does Australia have? What background knowledge do you need to answer this question?
If you travel by car from a tundra, which biome will you most likely visit next?
Which continent is mostly savannah and desert? What background knowledge do you need to answer this question?
Study the pictures and text under the map. How do they support the map?



CROSS-CURRICULAR EXTENSIONS



Lave students try these activities to expand their knowledge and interest in ecology.

Math

◆ Pages 4–5

In some biomes, the temperature rarely rises above 0°F. In others, the temperature rarely drops below 100°F. Show students that both Fahrenheit and Celsius are marked on most thermometers. Introduce conversion formulas to older students: F = 9/5 (C+32); C=5/9 (F-32). Have students use the thermometer or conversion formulas to do some conversion problems. For example, what is 8°F on the Celsius scale? 30°F? 80°F? 100°F? What is 30°C on the Fahrenheit scale? 10°C? 55°C?

♦ Pages 14–15

Earth's population is approximately six billion people. Have students find out the population in various countries throughout the world. Have students develop word problems using these numbers, including how many more people live in one country than another, or how many times more people live in one country than another.

Language Arts

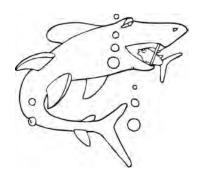
♦ Pages 10-11

Have students look at and discuss the photograph on pages 10 and 11. Encourage students to write a poem or short piece that expresses their feelings about the picture and how it relates to ecology.

Science

Page 6

Have students look at the illustration of a food chain on page 6. Ask them to describe, in their own words, how a food chain works and draw one of their own. It should have five levels, like the one shown. Display the food chains on a bulletin board and ask students to look for animals or plants that appear in more than one food chain.



♦ Pages 10-11

Have students research which plants and animals are on the endangered list. Students should write a one-paragraph statement explaining their feelings about plants and animals becoming extinct.

♦ Page 12

Volcanic eruptions and forest fires are two natural disasters that can have a profound effect on the environment. Have students research one volcanic eruption or fire that took place within the past 50 years. Students should tell when and where it occurred; what happened as an immediate result of the disaster; and how things



have changed, if at all, between the time of the disaster and today.

Art

◆ Pages 2–3

After students look at the illustration on pages 2 and 3, have them work in groups and come up with their own illustration of "Six Ways of Looking at Our Planet." Students should decide which "individual" they would like to feature. (The individual in the diagram in *Ecology* is a gray cat.) They should put that at the bottom of their drawing and include that individual in each level. Students should be sure that the biome they illustrate is one where their chosen individual might reside.

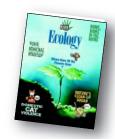
◆ Pages 8–9

Ask students to design their own illustrations and captions for the water cycle. Remind students to use their own words to explain each step in the water cycle. •



Name ANSWER KEY

Date			



Get Set to Read

What do you know about ecology? In "Before Reading," write *true* if you think the statement is true. Write *false* if you think the statement is not true. Then read KIDS DISCOVER *Ecology*. Check back to find out if you were correct. Write the correct answer and the page number where you found it.

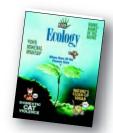
CHALLENGE: Rewrite each false sentence in a way that makes it true.

Before Reading		After Reading	Page Number
	1. Ecology is the study of living things and their environment.	True	p. 2
	2. Tundra is an example of a water biome. (land biome)	False	p. 4
	3. Plants make their own food.	True	p. 6
	4. Carbon dioxide helps to trap the Sun's energy.	True	p. 9
	5. Humans have caused the extinction of some species of plants and animals.	True	p. 10
	6. About 99 percent of the species of plants and animals that ever lived on Earth are still alive. (now extinct)	False	p. 10
	7. In an ecosystem, more than one kind of animal has the same niche. (each kind of animal has its own unique niche)	False	p. 13
	8. Natural disasters, such as volcanoes, have only harmful effects. (harmful and helpful effects)	False	p. 13
	9. Human activities have little impact on other animals. <i>(great)</i>	False	p. 15
	10. The number of amphibians on Earth is increasing. (decreasing)	False	p. 16
•		- 0 0	



Name ANSWER KEY

Date							



It's in the Reading

After reading KIDS DISCOVER Ecology, choose the best answer for each question. Fill in the circle.

Find your answers on the pages shown in the book icon next to ea	ch question.
1. The term ecology comes from Greek words meaning	
O A. the science of living things	

• B. the study of a place to live (word meaning) **O C.** the science of ecosystems

O **D.** the study of natural history

2. (Cold winters,	hot summers,	and few	trees are	characteristics of	of
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- A. temperate grasslands (classification)
- O B. deserts
- O C. chaparral
- O **D.** tundra



- **3.** One way mushrooms differ from plants is that mushrooms .
 - O A. do not move around
 - B. are decomposers (comparison and contrast)
 - O C. make their own food
 - O **D.** do not grow



- 4. The honey guide bird and ratel work together to find food. In this way, the honey guide bird gets the beeswax it eats and the ratel gets the honey it eats. Their relationship is an example of ____.
 - O A. parasite relationship
 - **O B.** decomposition
 - C. mutualism (generalization)
 - O **D.** commensalism
- 5. Carbon dioxide is taken in by ____.
 - O A. rotting plants and animals
 - O B. burning fuels
 - O C. living animals
 - D. living plants (details)







It's in the Reading (continued)

 6. Homo sapiens is the species name for ○ A. plankton ○ B. impalas ● C. humans (context clues) ○ D. African elephants 	10 11
 7. In an ecosystem, cheetahs may be part of the same as lions. ○ A. niche ○ B. population ● C. community (classification) ○ D. species 	12 13
 8. In the process of succession, the first plants to return to a destroyed area are A. grasses and weeds (sequence) B. bushes C. small trees D. large trees 	12 13
 9. Farmland is being replaced by housing and businesses because A. people need less food B. farming the land is less profitable than providing housing and businesses (conclusion) C. more people need larger homes D. the land is no longer good for farming 	14 15

10. What's your opinion? Are people's activities increasing the likelihood of global warming? Can people do something to prevent global warming? What can you as an individual do?

Answers will depend on students' opinions. Most are likely to agree that individuals can help prevent global warming through conservation and other choices.



Name ANSWER KEY

MAKEUP	Col	OU	
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	1		
DOMESTIC	Very	SOLL	

_____ Date ____

Everything Visual

Maps are useful visuals that may show countries, mountains, roadways, or land features. Together with map keys, they provide information about an area. Study the map of the continents on pages 4–5 of KIDS DISCOVER *Ecology*. Find the names of the continents on another map. Then answer the questions.

1. What is the title of the map?

"Biomes of the World" is the title of the map.

2. What information about the map does the map key provide?

The map key identifies the biome each color on the map represents.

3. Which continents on the map do not have a tundra biome?

South America, Africa, and Australia do not have tundra.

4. What biomes does Australia have? What background knowledge do you need to answer this question?

Australia has tropical rain forest, temperate rain forest, temperate grassland, savannah, chaparral, and desert. Students need to know the location of Australia.

5. If you travel by car from a tundra, which biome will you most likely visit next?

From the tundra, you would enter the coniferous forest.

6. Which continent is mostly savannah and desert? What background knowledge do you need to answer this question?

Africa is mostly desert and savannah. Students need to know the names of the continents and their location.

7. Study the pictures and text under the map. How do they support the map?

The pictures and captions provide detailed information about each biome shown on the map and its characteristics.