



SCIENCE • GRADE 3

California Content Standards
Life Sciences: 3.C
Life Sciences: 3.D
Life Sciences: 3.E

On Level

What Happens When Habitats Change?

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What Happens When Habitats Change?

California's Science Content Standards Met

GRADE 3 SCIENCE

LIFE SCIENCES: 3—Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

- c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
- d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
- e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

GRADE 3 ENGLISH LANGUAGE ARTS

1.0 WORD ANALYSIS, FLUENCY, AND SYSTEMATIC VOCABULARY DEVELOPMENT

Vocabulary and Concept Development 1.6—Use sentence and word context to find the meaning of unknown words.

2.0 READING COMPREHENSION

Comprehension and Analysis of Grade-Level-Appropriate Text 2.2—Ask questions and support answers by connecting prior knowledge with literal information found in, and inferred from, the text.

Comprehension and Analysis of Grade-Level-Appropriate Text 2.5—Distinguish the main idea and supporting details in expository text.



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Student Book

What Happens When Habitats Change?

Print pages 5 – 18 of this PDF for the student book.

How to Make the Student Book

- The student book is contained on pages 5–18 of this PDF. It begins on the next page.
- To make one student book, or a two-sided master copy that can be photocopied, you will print on both sides of seven sheets of 8.5" x 11" paper.
- Do a test printout of one book first to familiarize yourself with the procedure.
- Follow these instructions carefully.

First—Select the Paper

Since you will be printing on both sides of the sheets of paper, select a good quality white paper. We recommend using at least a 22lb sheet.

Second—Check Printer Settings

Be sure you have the correct page setup settings for your computer and printer. You will print these pages in landscape format.

Third—Print EVEN Pages

Open the PDF of the book you want to print. Select print from your file menu. In your printer's dialogue box enter pages 5–18 to print. Then select EVEN pages only. It is important to print only the EVEN pages first. Click "Print" to print the even pages. (**Important note:** The first page that prints will be blank. DO NOT discard this page. It will be needed to print the cover in the next step.)

Forth—Print ODD Pages

When the even pages have printed, flip the stack of pages over to print the odd pages. Place the stack back in your printer. Select print from the file menu again. In your printer's dialogue box, select ODD pages. Click "Print" to print the odd the pages.

Fifth—Fold the Book

You now have a complete book. Check to be sure the pages are in the correct order with the book's cover as the top page. Then fold the stack of paper in half.

Sixth—Staple the Book

Use an extended-length stapler to staple the pages together. Place three staples in the spine of the book.

Please note that printers vary in how they output pages. Do a test printing with one book and adjust the procedure as necessary.

If you want to make a one-sided master copy, print ALL pages 5–18 at once. Then select "one-sided to two-sided" on the copy machine.

What Happens When Habitats Change? **OL**

California's Science Content Standards Met

GRADE 3 SCIENCE

LIFE SCIENCES: 3—Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

- c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
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GRADE 3 ENGLISH LANGUAGE ARTS

1.0 WORD ANALYSIS, FLUENCY, AND SYSTEMATIC VOCABULARY DEVELOPMENT

Vocabulary and Concept Development 1.6—Use sentence and word context to find the meaning of unknown words.

2.0 READING COMPREHENSION

Comprehension and Analysis of Grade-Level-Appropriate

Text 2.2—Ask questions and support answers by connecting prior knowledge with literal information found in, and inferred from, the text.

Comprehension and Analysis of Grade-Level-Appropriate

Text 2.5—Distinguish the main idea and supporting details in expository text.

Comprehension and Analysis of Grade-Level-Appropriate

Text 2.6—Extract appropriate and significant information from the text, including problems and solutions.



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What Happens When Habitats Change?

by Linda Barr





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Curriculum materials for **your** content standards

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INTRODUCTION

Things Change

Like you, plants and other animals live in **habitats**. Their habitats meet their needs. If a habitat changes, it might no longer meet an animal's needs. That animal might move to a nearby habitat. However, that habitat might already be crowded. Then it cannot meet the new animal's needs.

What happens to plants when a habitat changes? They may move slowly to a new habitat. Animals, wind, or water may carry their seeds.

Yet when a habitat changes, many of its living things will not survive. In this book, you will learn ways that habitats can change, for better or for worse.

habitat: the place where an animal lives and has its needs met

CHAPTER 1

Harmful Changes to Habitats

Pollution

Pollution is something harmful in the air, water, or soil. For example, cars, trucks, buses, and planes burn gasoline. Power plants burn coal to make electricity. This sends harmful gases into the air. These gases can make it harder for us to breathe.

People use chemicals to help plants grow and kill weeds and insects. Rain can wash these chemicals into the soil. It can carry them into rivers and streams. This pollution can kill animals that live in the water, such as frogs, insects and fish.

Trash can also leak chemicals into the soil. They can make animals sick and keep plants from growing. That means less food for all of us.

What are some ways that pollution can get into the ocean?

Loss of Habitat

Sometimes people cut down a forest. They want wood to build houses. They need space for buildings. The forest plants and animals lose their habitat. Only some of them can move to a new habitat.

Sometimes people build dams to produce electricity. The dams change how rivers flow. People also fill in wetlands to make land for houses. The plants and animals in those rivers and wetlands must move or die.

Even building a road through a forest can harm the animals. Cars might hit them as they cross the road. Fences keep animals off the road, but they make their habitat smaller.

Unwelcome Guests

You know that sometimes animals move to a new habitat. Animals, people, and the wind carry seeds to new places. These new plants or animals can crowd out the old ones there.

One example is a weed called purple loosestrife. It was brought to our country about 200 years ago. Now it grows in nearly every state. It is taking over lakes and streams in northern California.

A loosestrife plant can be 7 feet tall. Each plant can produce more than a million seeds. The plants fill in wetlands and clog rivers. Scientists are looking for safe ways to get rid of this weed.



Why does purple loosestrife spread quickly?

Natural Changes

Natural events can also change habitats. Lightning can start fires. Floods can cover habitats. A volcano can explode, spreading ash.

A beaver dam, like a human dam, plugs up a river or stream. It forms a pond. The plants and animals below the dam may lose their homes. Those above the dam must adapt to living in a pond.

Too many animals can also change a habitat. Too many deer may eat most of the available leaves. Then they and other leaf-eaters will starve. Too many hawks may eat all the mice. Then the hawks and other mice-eaters will go hungry.



Beaver dams change the habitat around a stream or river.

CHAPTER 2

Helpful Changes to Habitats

People are trying to protect habitats. For example, we are burning less gasoline. More people share car rides. More take the bus or ride their bikes. That reduces pollution in the air.

We are also recycling glass, plastic, and paper. Then these materials can be used again. It takes less energy to make products from recycled materials. When we need less electricity, we burn less coal.

People are also using fewer insect and weed killers. We are finding safer ways to protect crops from insects and weeds. That reduces soil and water pollution.

Old dumps and landfills are being cleaned up. That means fewer chemicals leaking into the soil and water. New landfills don't leak.

When builders cut down trees, they plant new ones. When they build houses, they add ponds and parks.

Many areas are set aside for wildlife. No one can build there or change the habitat. California has many wildlife **refuges**. You might visit the Salinas River Wildlife Refuge. It's north of Monterey. Its habitats include dunes, grassland, marsh, ocean, and river. You might spot a rare California brown pelican. Many other birds live near the shore.

Explain how changes in an organism's habitat are sometimes good and sometimes harmful.

refuge: a wild area set aside to protect the plants and animals that live there

Learning About the Past

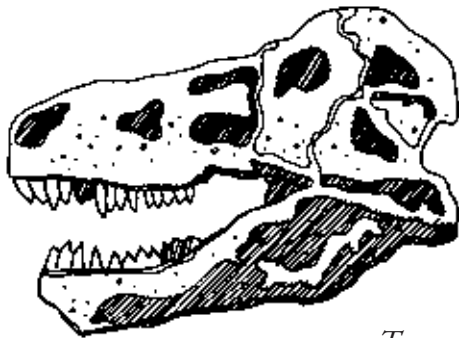
What happens when a habitat changes? Let's say that dry weather kills the grass in one habitat. The rabbits and other grass-eaters there go hungry. Many might die. With few plant-eaters, the meat-eaters will starve, too.

Dinosaurs lived for millions of years in their habitats. Then those habitats changed. They no longer met the dinosaurs' needs. Some scientists think that a huge meteor slammed into Earth. It caused a giant cloud of dust that filled the sky. The dust blocked out the sunlight for months, or longer. Plants stopped growing. Then the plant-eaters starved. With no plant-eaters, the meat-eaters also starved.

Some scientists think that a huge meteor caused the death of dinosaurs. Is what they think a fact or an opinion?

In time, all of the dinosaurs died. That was millions of years before humans lived on Earth. No one ever took a photograph of a dinosaur. So how do we know that *Tyrannosaurus rex* once shook the ground when it walked? How do we even know what a *T. rex* looked like?

People have found thousands of **fossils** left behind by *T. rex* and other dinosaurs. They have also found fossils of other animals and plants. We will never see many of these plants and animals alive. What have we learned from their fossils? Keep reading to find out!



Tyrannosaurus rex

fossil: a piece of a body or a footprint left behind by a living thing that died long ago

Mold and Cast Fossils

Mold and cast fossils show us what an ancient living thing looked like. Trace fossils show us how it lived.

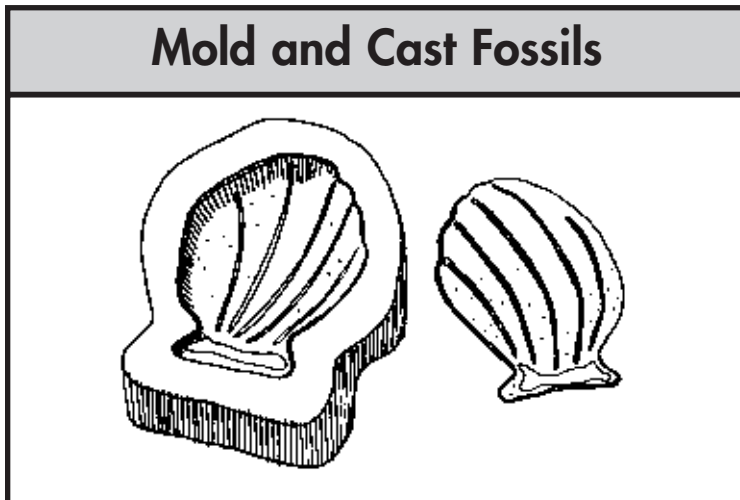
How do mold and cast fossils form? After a living thing dies, its skin, muscles, and other soft parts **decay**. Left behind are any hard parts—teeth, bones, claws, a shell, or bits of hatched eggs. Most plants decayed before they could become fossils. However, a few were quickly buried in mud.

Over millions of years, more mud and soil covered the plant and animal **remains**. It turned into rock. Rainwater flowing through cracks in the rock **dissolved** the remains.

decay: to break down and return materials to the environment
remains: what is left after a living thing dies
dissolved: changed from a solid into a liquid

Left behind was an empty place, called a mold, that had the same shape as the teeth, bones, shell, or leaf. In time, minerals from the soil filled up the mold. The minerals hardened and formed a rock in the shape of the teeth, bones, shell, or leaf. This kind of fossil is called a cast.

Molds and casts show the shape and size of part of a living thing. Then scientists can figure out the shape and size of the entire plant or animal.



The fossil on the left is a mold. This empty space formed when an ancient shell dissolved. Over time, minerals filled the mold. They formed the cast fossil on the right. Do you see how the cast fits into the mold?

Trace Fossils

Your muddy footprints are traces of you. Ancient animals also walked through mud. In time, the mud hardened into rock. It kept the shape of their footprints. Fossil footprints have been found in riverbeds and coal mines.

Trace fossils include **burrows** that ancient animals dug. They hardened into rock. Even some animal droppings became a trace fossil!

Trace fossils can show how big an animal was and how much it weighed. They can show where and when the animal lived. A burrow can tell how an animal lived.

Fossils are proof that certain plants and animals once lived on Earth.

Explain how fossils provide evidence about animals that lived long ago.

burrows: holes or tunnels dug into the ground by an animal

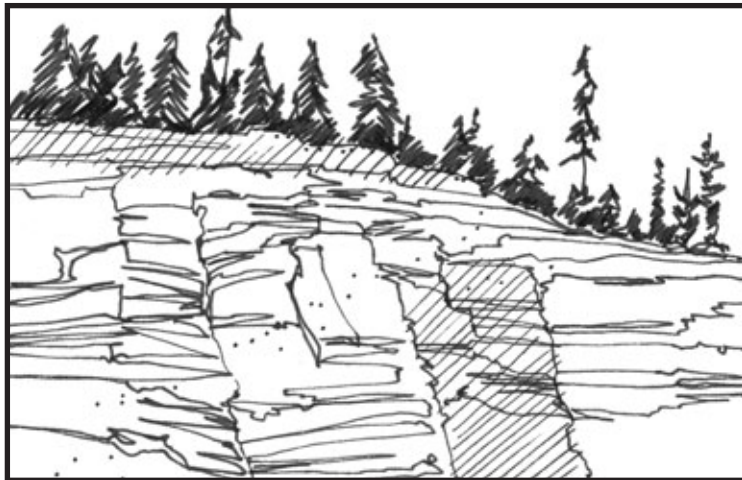
Age of Fossils

How can we tell the age of a fossil? The oldest fossils are buried the deepest.

Scientists can tell the age of a layer of rock. The fossils found in a layer of rock lived at the same time that layer formed.

Plant fossils tell about a habitat's weather long ago. For example, ferns lived where it was warm and wet. If you find fern fossils, you know that area was once a swamp.

Scientists study fossils found in different layers of rock to determine what plants and animals lived at the same time.



How can scientists figure out what a certain dinosaur ate?

CHAPTER 4

Extinct Plants and Animals

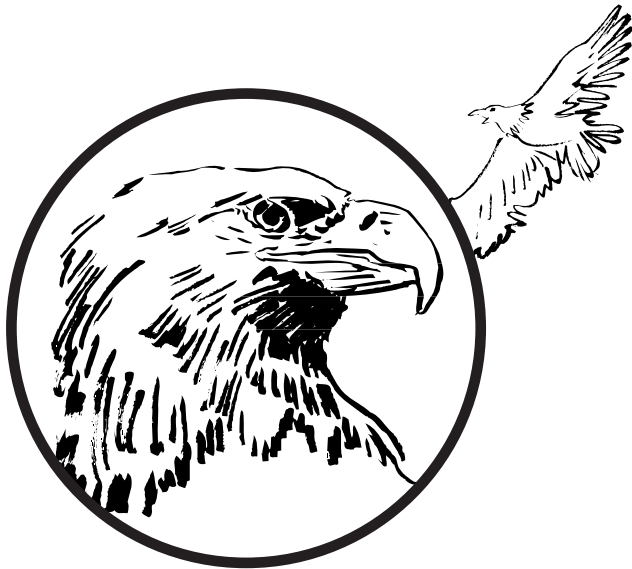
Once, much of Earth was covered with swamps. Later, ice covered some areas. In fact, California has been much wetter, warmer, and colder than it is now. Many plants and animals could not adjust to these changes. They could not deal with the increasing cold—or heat. They could not find enough food. Their habitat no longer met their needs, so they died.

Thousands of kinds of plants and animals are now extinct. Yet some kinds have survived for a very long time. A few have lived on Earth since before the dinosaurs.

extinct: no longer living on Earth
ancient: having lasted a long time

Today, people are working on ways to protect the habitats of our plants and animals. They want to stop plants and animals from becoming extinct.

Not long ago, bald eagles almost become extinct. The cause was the chemical DDT. Farmers sprayed it on their crops to kill insects. Then mice ate those crops. As bald eagles ate the mice, DDT built up in the eagles' bodies. It caused their eggshells to break. Few eaglets hatched. In 1972, a law stopped the use of DDT. Now bald eagles are making a comeback.



Which plants or animals are most likely to become extinct? Those that can live only in one habitat or eat only one kind of food. If that habitat changes, the plant or animal may die.

For example, giant pandas eat mostly bamboo. Many bamboo forests have been cut down. In time, the pandas may not survive in the wild.

The rain forest is home to many living things. In four square miles, you can find about 1,500 flowering plants and 750 kinds of trees. Overhead fly 400 kinds of birds. Most of them could not live somewhere else.

Yet more than 56,000 square miles of rain forest are lost each year. The land is cleared for farming and mining. The trees are cut down. Many living things lose their habitat. How many become extinct?

What kind of investigation would help scientists determine how many kinds of birds live in a certain part of the rain forest?

Ancient Plants and Animals

As ice began to cover the land, some animal **populations** died. Others moved to warmer places or grew thicker fur. They ate what they could find. They survived.

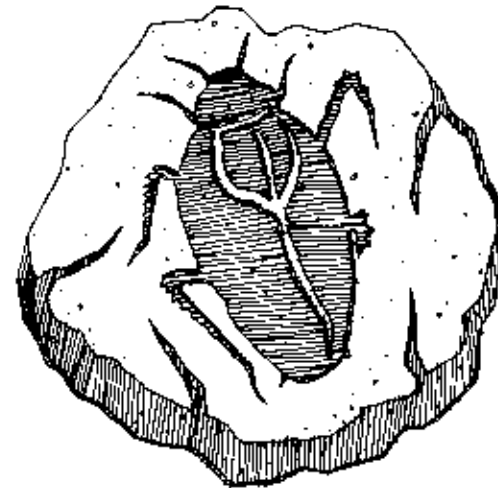
Fossils tell us that a few kinds of plants and animals have survived for millions of years. One is the alligator. It has lived on Earth for more than 200 million years. It still looks much the same. It can adapt to most changes. Its only enemy is people. If people preserve their habitat, they may survive another million years.

Cockroaches are also survivors. The first ones lived about 350 million years ago. They will eat almost anything. They even like shoe polish, wool, and dead bugs. Some can live three months without food and one month without water.

population: the number of a particular type of living thing at a particular place and time

These bugs are happy in the rain forest, the desert, and your home. They can sense movement around them. This protects them from other animals.

Cockroaches left behind fossils. They show that today's bugs look like those that lived with the dinosaurs. Yet fossils are all we have left of the dinosaurs. Which would you rather have alive today, dinosaurs or cockroaches?



Explain how we know that extinct organisms may resemble organisms that are alive today.

Glossary

ancient—having lasted a long time

burrows—holes or tunnels dug into the ground by an animal

decay—to break down and return materials to the environment

dissolved—changed from a solid into a liquid

extinct—no longer living on Earth

fossil—a piece of a body or a footprint left behind by a living thing that died long ago

habitat—the place where an animal lives and has its needs met

population—the number of a particular type of living thing at a particular place and time

refuge—a wild area set aside to protect the plants and animals that live there

remains—what is left after a living thing dies

To Find Out More . . .

Want to learn more about what happens when habitats change?

Try these books

Dinosaur Hunters by Kate Mcmullan. Random House, 2005.

Ecology (DK Eyewitness Books) by Steve Pollock. DK Children, 2005.

Endangered Animals by Rhonda Lucas Dona. Children's Press, 2002.

Monster Bones: The Story of a Dinosaur Fossil by Jacqui Bailey. Picture Window Books, 2004.

Survival and Change by Steve Parker. Heinemann, 2006.

Access these Web sites

Learn all about fossils at Oxford University Museum's Learning Zone.

<http://museum.gov.ns.ca/mnh/nature/tracefossils/english/sections/whatare.ht>

The San Diego Natural History Museum offers more information about fossils and dinosaurs.

www.sdnhm.org/kids/dinosaur/

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ENGLISH-LANGUAGE ARTS • GRADE 3

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Comprehension and Analysis of Grade-Level-Appropriate Text: 2.5
Comprehension and Analysis of Grade-Level-Appropriate Text: 2.5

On Level

English-language Arts Activities

What Happens When Habitats Change?

Print pages 20–24 of this PDF for the reading activities.

Context Clues

TRY THE SKILL

In this book, you learned a new meaning of the word *mold*. You already knew that *mold* can mean the green or black stuff that grows on stale bread. Now you know that a mold is also one kind of fossil. It formed when the remains of an ancient living thing dissolved and left an empty space in a rock.

When you read new words, or words used in new ways, you have many ways to figure out what they mean. You can read the rest of the sentence or paragraph. The word might also be defined on that page or in the glossary. For example, read this paragraph:

Old dumps and landfills are being cleaned up. That means fewer chemicals leaking into the soil and water. New landfills don't leak.

What does the word *landfill* mean?

The passage gives a big clue about its meaning. It says "dumps and landfills," so a landfill is like a dump. It's a place to throw trash. Trash includes containers with liquid in them. That liquid might leak into the soil and water, but new landfills—or trash dumps—are built so they won't leak.

Read the paragraph and then explain what *adapt* means. Tell which clues you used to figure it out.

A beaver dam, like a human dam, plugs up a river or stream. It forms a pond. The plants and animals below the dam may lose their homes. Those above the dam must adapt to living in a pond.

***Adapt* means:**

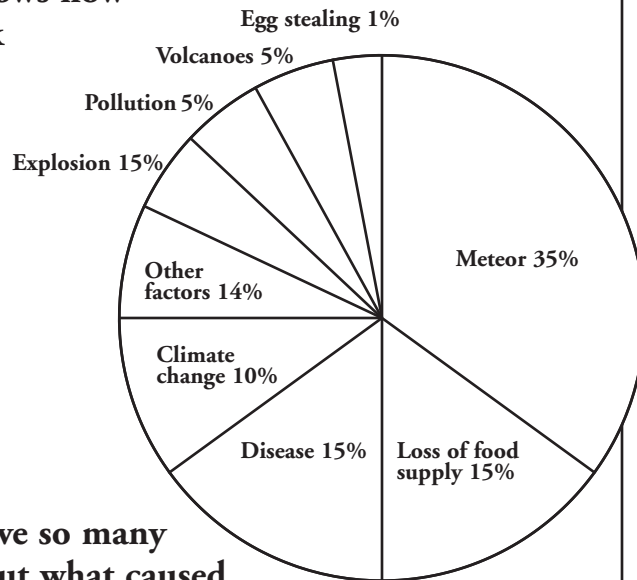
I know this because:

Make Inferences

TRY THE SKILL

To make an inference, you think about what you read and what you already know. Then you reach a decision.

To practice, study the graph below. It is based on the opinions of a group of people who are interested in dinosaurs. It shows how many people think dinosaurs became extinct for different reasons.



Why do people have so many different ideas about what caused this extinction? Make an inference.

You have read that the dinosaurs became extinct long before people lived on Earth. You know that people have different opinions about something when no one knows the truth. You can infer that people have different opinions about the extinction of dinosaurs because no one knows for sure what killed them.

To practice inferring, study the graph. Then think about what you know and answer these questions.

1. Why did only a few people think extinction was caused by pollution?
Ⓐ Dinosaurs were too big to be bothered by pollution.
Ⓑ No one was burning fossil fuels back then.
Ⓒ People are just not sure what caused this extinction.
Ⓓ Back then, people did not realize the dangers of pollution.
2. Why did most people think a meteor caused extinction?
Ⓐ They heard older people talk about watching the meteor crash.
Ⓑ They have proof that this was the cause.
Ⓒ It makes sense, based on what they know.
Ⓓ Scientists found dinosaurs that had been crushed by a meteor.

Ask Questions

TRY THE SKILL

You can use the facts you read to ask questions. For example, in this book you read about the helpful and harmful ways that habitats can change.

Let's say that two gardeners are friends. One lives in northern California and the other one in Maine.

The gardener in Maine sends some seeds from her favorite plant to her friend in California. California is warmer and sunnier than Maine, so the seeds grow very well in the California garden.

What might happen in this garden?

The new plants will crowd out the plants that are already growing there.

Will the California gardener be happy?

No, because many of her plants will die.

Read each description. Then shade in the circle next to your choice.

1. A road is built through a thick forest so people can visit the forest more easily. How will this road affect the animals living in that forest?
 - Ⓐ The road will help the animals move around in the forest.
 - Ⓑ Visitors using the road will bring healthful food for the animals.
 - Ⓒ The road may separate animals from their food supply.
2. A rare bird lives in the rain forest in Indonesia. It eats only the fruit of the jambu tree. A rancher clears many acres of the forest so his cattle can graze there. The nearest jambu trees are now miles away. How will this change affect the rare bird?
 - Ⓐ The bird will find other fruit to eat.
 - Ⓑ The bird will have to find other jambu trees before it starves.
 - Ⓒ The bird will find a way to share the cleared land with the cattle.

Identify Problems and Solutions

TRY THE SKILL

Good readers think about what they read. They can identify problems even when the author does not state them in so many words. For example, read this passage:

Trace fossils can show how big an animal was and how much it weighed. They can show where and when the animal lived. A burrow can tell how an animal lived. Fossils are proof that certain plants and animals once lived on Earth.

What problem is hinted at in this passage?

You know that many kinds of plants and animals disappeared from Earth long ago. The passage says that fossils are our only proof that these plants and animals once lived. The problem is that, unless a living thing left behind a fossil, we cannot know that it ever existed.

Read the paragraph below. Think about why being able to live only in the rain forest is a problem for a plant.

The rain forest is home to many living things. In four square miles, you can find about 1,500 flowering plants and 750 kinds of trees. Overhead fly 400 kinds of birds. Most of them could not live somewhere else.

1. Shade the letter that describes the problem.
 - Ⓐ All those birds eat the plant's seeds.
 - Ⓑ When a rain forest is cut down, the plant loses its habitat.
 - Ⓒ The rain forest is crowded with other plants.

Read this passage. On the back of this page, explain how dams can be both a problem and a solution for a habitat.

Sometimes people build dams to produce electricity. The dams change how rivers flow. People also fill in wetlands to make land for houses. The plants and animals in those rivers and wetlands must move or die.

Answer Key

Context Clues

Adapt means “make changes.”

I know this because the plants and animals must make changes in their lives so they can live in a pond.

Make Inferences

1. C
2. B

Ask Questions

1. C
2. B

Identify Problems and Solutions

1. B
2. Possible answer: Dams can be a solution for the people who live there because they produce needed electricity. Dams can be a problem for the plants and animals upstream and downstream because their habitat changes or disappears.