Sample Pages from

Teacher Created Materials

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Teacher Created Materials Bookroom Grade-Level Collection Grade 5

This sample includes the following:

Teacher Created Materials

Bookroom

Grade-Level Collection

Management and Assessment Guide

Grade 5

Table of Contents

How to Use This Product

Setting up the *Teacher Created Materials Bookroom Grade-Level Collection* is as simple as unpacking the shipping box and placing the bin on a shelf. The grade 5 collection includes guided reading levels T–V. The labeled bin is pre-packed with 15 pouches, each of which includes 6 copies of a leveled book, an easy-to-use lesson plan, and a checkout card. For a complete list of books offered in this grade-level bin, see Appendix A.

Components

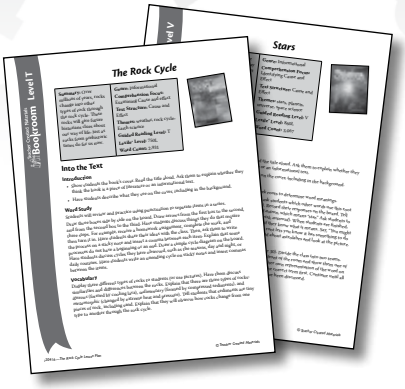
Leveled Books

The collection of books in the *Teacher Created Materials Bookroom Grade-Level Collection* includes titles from a variety of successful series.

- ***TIME For Kids Nonfiction Readers*** are designed to enhance any reading program. Each book motivates students to want to read with high-interest content and engaging photographs. The authentic reading experiences help students develop vocabulary, comprehension, and fluency skills.
- ***Primary Source Readers*** are designed around primary sources that provide details about a particular subject. These primary sources include personal papers, letters, notes, photographs, drawings, government documents, and more. With primary sources, history changes from studying events in a textbook to a more intimate focus on the humans who shaped each historical event.
- ***Science Readers*** provide students with access to high-quality informational text partnered with scientific investigations. Teachers model a variety of literacy strategies while teaching science content in a meaningful context. Many of the activities in Science Readers support STEAM education.
- ***Mathematics Readers*** integrate reading instruction with mathematical concepts. These leveled readers combine problem solving and real-world connections that provide students with opportunities to explore mathematical practices in meaningful ways.

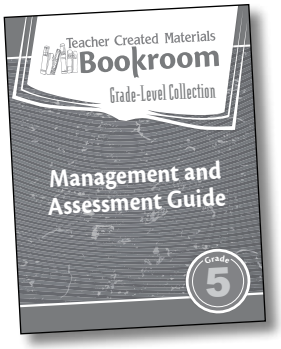
Lesson Plans

The easy-to-implement lesson plans were specifically designed to support guided reading instruction. Activities help teachers implement a balanced literacy framework with suggestions for before, during, and after reading. For detailed information on using the lessons, see "Teaching a Lesson" on page 29.



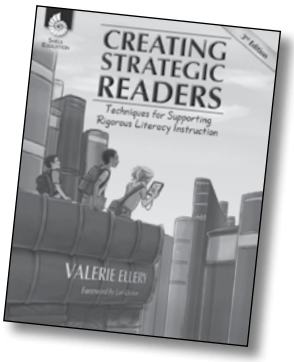
Management and Assessment Guide

The Management and Assessment Guide provides information on how to efficiently and effectively implement the *Teacher Created Materials Bookroom Grade-Level Collection* as well as best practices for implementing balanced literacy and differentiated reading instruction. The comprehension assessment and oral reading record for each title are included, along with guidance for administering the assessments.



Professional Development

One copy of *Creating Strategic Readers: Techtechniques for Supporting Rigorous Literacy Instruction* is provided as a professional resource that supports teachers in their implementation of a comprehensive literacy classroom.



Teaching a Lesson

The *Teacher Created Materials Bookroom Grade-Level Collection* lessons each contain activities to address word study, vocabulary, comprehension, and writing. Teachers may choose to complete some or all of the lesson activities in order to best meet the needs of their students. Each lesson begins with an overview box that provides key information for planning purposes. The lessons include direction for instruction and practice before, during, and after reading.

Into the Text

- **Introductory Activity:** Teachers and students will discuss observations about the book's cover and title, discuss genre, and activate background knowledge.
- **Word Study:** Each activity targets a Common Core Language or Foundational Skills standard. These standards include topics such as generalizing spelling patterns, identifying affixes, generating synonyms, or pluralizing irregular nouns.
- **Vocabulary Activity:** Students will receive an introduction to key vocabulary words in the text, or words that will help them better understand concepts in the text.

Through the Text

- **Comprehension Focus:** Within each text, a specific reading skill or strategy is taught through explicit instruction, teacher modeling, guided practice, and independent application.
- **Language Support:** Differentiation options are presented to help support English language learners access the text and/or respond to the text. Each option focuses on developing reading, writing, speaking, or listening proficiency.
- **Text-Dependent Questions:** These comprehension questions require students to think critically and cite evidence directly from the text.

Beyond the Text

- **Writing Activity:** Each writing prompt allows students to creatively reflect on their reading. Some options include friendly letters, brochures, persuasive posters, and picture books.
- **Extension Activity:** These multi-modal activities engage students as they apply new knowledge gathered from the text in a fun and creative way.

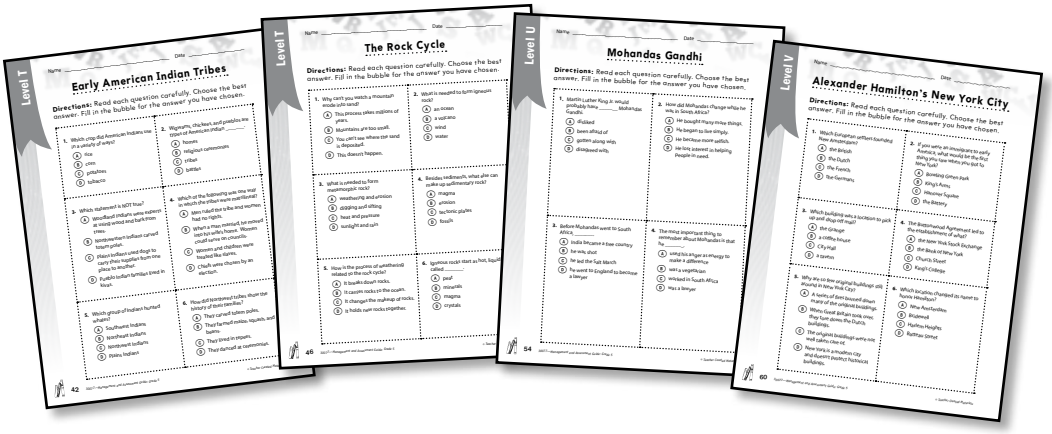
How to Use the Assessments

Assessment Opportunities

When working with the books and lessons in the *Teacher Created Materials Bookroom Grade-Level Collection*, teachers can assess students' progress and reading development in a variety of ways. Assessments are provided for all of the books in the *Bookroom Collection* resource, offering teachers the option to use any title to assess fluency or comprehension. Teachers may use them when and how they feel will best serve their classroom needs. These assessments and tools may be photocopied from the Management and Assessment Guide, or PDF files can be downloaded from the website **www.tcmpub.com/download-files**. To access the assessments in this resource, use the access code 62096844.

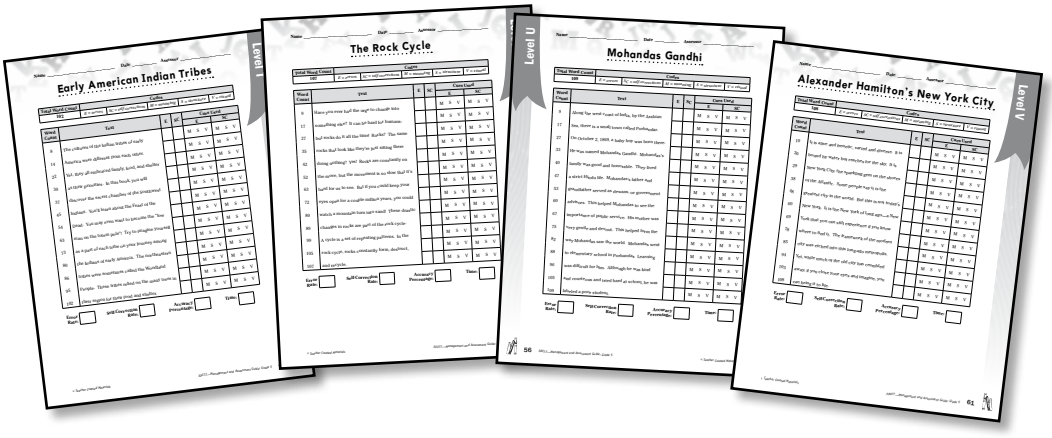
Comprehension Assessments

A comprehension assessment is included for each title. These assessments are offered in a multiple-choice format, providing an opportunity to both gauge student learning in relation to content and practice with standardized-test formats.



Oral Reading Records

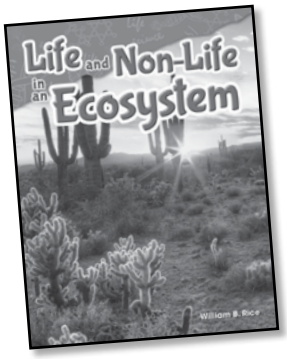
An oral reading record for each book is also included. Detailed instructions for using the oral reading records are provided on the following pages of this Management and Assessment Guide. Depending on instructional needs, teachers may use the oral reading records as a diagnostic placement tool.



Teacher Created Materials Bookroom Level T

Life and Non-Life in an Ecosystem

Summary: How humans interact with other humans is a topic that makes headlines every day. But how humans and other living organisms interact with nonliving things is something we do not think about very often. Students will learn about how dirt, weather, and geographical features shape our lives.	**Genre:** Informational **Comprehension Focus:** Making Inferences **Text Structure:** Description **Themes:** animals, plants, ecosystems, life science **Guided Reading Level:** T **Lexile® Level:** 800L **Word Count:** 3,183



Into the Text

Introduction

- Show students the book's cover. Read the title aloud. Ask them to explain whether they think the book is a piece of literature or an informational text.
- Have students describe what they see on the cover, including in the background.

Word Study

Students will review and practice using context to find the meaning of words or phrases.

Discuss with students the different strategies there are for determining the meaning of an unknown word while reading. Say, "The information around the unknown word sometimes compares that word to something else. If you understand the comparison, you can probably figure out the meaning of the unknown word." Turn to page 4 and read the first sentence in paragraph two. Ask how they can use their knowledge of what a *city* is to help them determine what *rural* means. Explain, "The key word here is *or*. We can picture a big city, and *or* tells us that the other word means the opposite. We can use our knowledge of what a city is to know that somewhere that is rural is probably smaller, not as fast-paced, and has fewer people." Challenge students to find other comparison context clues in the book.

Vocabulary

Write the following vocabulary words on sheets of paper: *decompose*, *ecosystems*, *microorganisms*, *nutrients*, and *stimuli*. Discuss their meanings as a group, and then display the papers around the room. In small groups, have students rotate to each paper and draw pictures and write about that word using their background knowledge. Then, have a class discussion about the words and their meanings and discuss any misconceptions based on students work. Keep the papers as a reference for students to use throughout the lesson.

Through the Text

Comprehension (Making Inferences)

Students will make inferences as they read the text.

Say, "Good readers use clues in images and written text to determine implied meanings and to draw conclusions. This is called *making inferences*." Explain that good readers absorb information from the text, which can help them to make inferences. Tell students that it is important to cite evidence from the text to support inferences and conclusions. Read pages 6 and 7 aloud, and ask students what they can infer about this information. (*Without primitive organisms changing Earth's atmosphere, we may not be alive today. If for some reason our conditions were no longer in homeostasis, plants and animals might die off.*) Remind students to continue making inferences as they read the remainder of the text.

Language Support

Review the life and non-life relationships mentioned in the text. Ask students which one is the most important. Then, have them brainstorm similar relationships that are not mentioned, such as humans and electricity or seagulls and the ocean.

Text-Dependent Questions

Have students reread specific portions of the text as noted below and respond to the following questions. To maximize their learning, have students share their responses with partners before discussing them as a group.

1. Refer to page 6. Why was there no life on Earth when it first formed? (*Earth was very hot and had a molten volcanic surface.*)
2. Look at page 12. Why are decomposers an important part of an ecosystem? (*Decomposers break down dead matter.*)
3. Reread pages 16 and 17. How does the graph relate to the information on interdependence? (*The graph shows that the interdependence between humans and plants is not equal, as more carbon dioxide is being produced than can be filtered out.*)
4. Revisit page 21. What effects have humans had on Earth's atmosphere? (*Our fossil fuels release carbon dioxide and other gases, which cause the atmosphere to keep more heat and changes the climate and weather.*)

Beyond the Text

Writing About Reading

Have students write an informational paragraph about how living and nonliving things interact in an ecosystem. Remind students that informational writing should include a main idea supported by detailed sentences that reinforce, explain, or provide examples of the main idea.

Extension Activity

Ask students to illustrate their favorite living and nonliving relationship, using the diagram on page 15 for inspiration. Encourage students to add single sentences that describe the relationship.

Name _____ Date _____

Life and Non-Life in an Ecosystem

Directions: Read each question carefully. Choose the best answer. Fill in the bubble for the answer you have chosen.

1. Which best describes the relationship between living and nonliving things?

- (A) There is no relationship.
- (B) Nonliving things depend on living things.
- (C) Plants need the sun to live.
- (D) Living things need and affect nonliving things.

2. The _____ is the mass of air that surrounds Earth.

- (A) precipitation
- (B) atmosphere
- (C) hydrosphere
- (D) ecosystem

3. What is the nitrogen cycle?

- (A) photosynthesis
- (B) a large vacuole in plant cells
- (C) the process by which nitrogen is reused on Earth
- (D) the release of carbon dioxide into the air by animals

4. What is an important nonliving part of soil?

- (A) air
- (B) decomposers
- (C) bacteria
- (D) mycelia

5. What supports the idea that oxygen is an important part of Earth's atmosphere?

- (A) The atmosphere is mostly made up of nitrogen.
- (B) Animals need oxygen to live.
- (C) Plants use carbon dioxide.
- (D) The atmosphere is the layer of air that surrounds Earth.

6. Which statement below best describes the relationship between climate and weather?

- (A) Climate is warm and weather is cold.
- (B) Weather happens in a year, and climate happens each day.
- (C) Climate is the usual type of weather in a place.
- (D) Neither climate nor weather depend on temperature.

Name _____ Date _____ Assessor _____

Level T

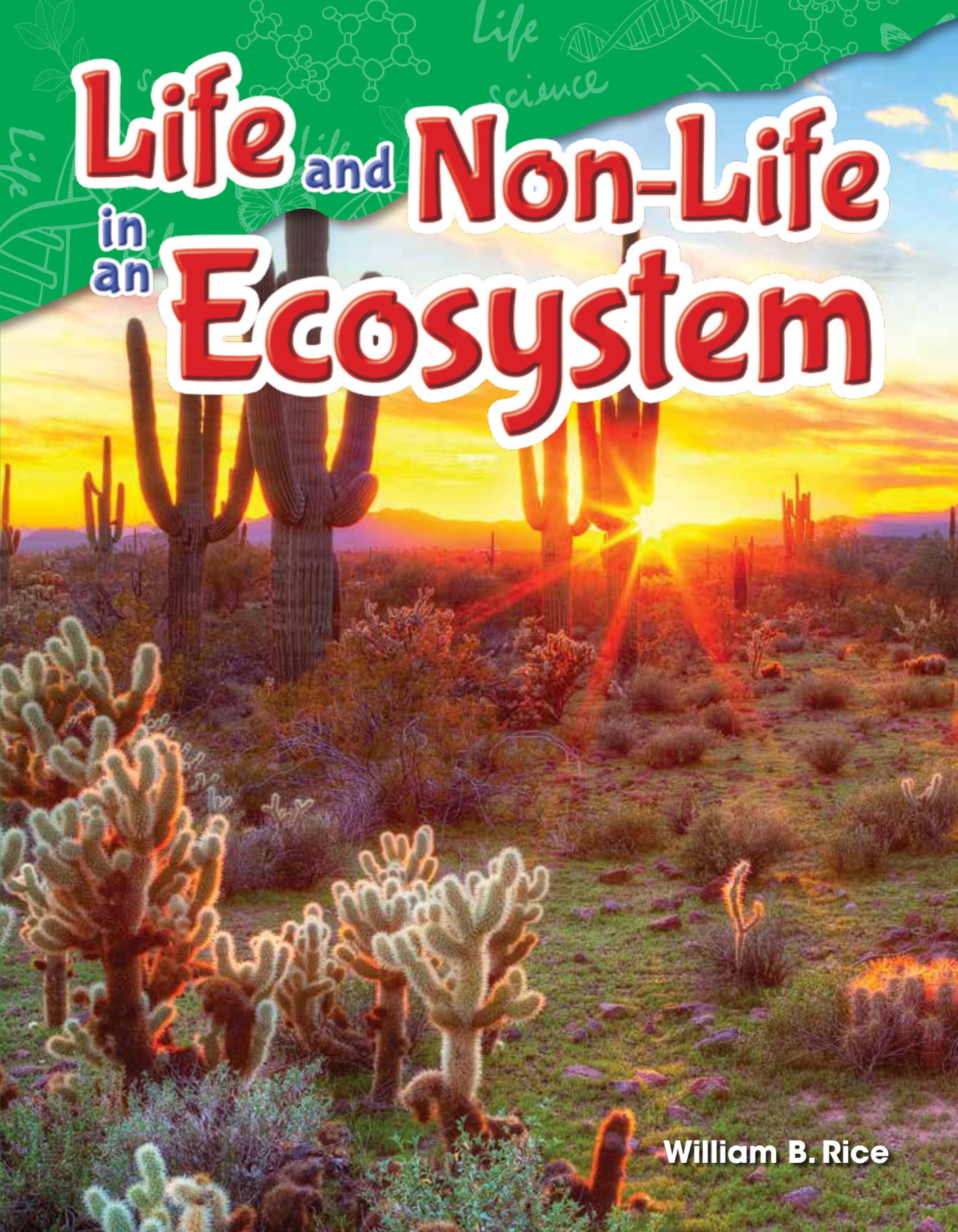
Life and Non-Life in an Ecosystem

Total Word Count	Codes				
113	*E = errors*	*SC = self-corrections*	*M = meaning*	*S = structure*	*V = visual*

Word Count	Text	E	SC	Cues Used	
				E	SC
10	Sure, it's home. But what is it about this place			M S V	M S V
18	called Earth that makes it as remarkable as			M S V	M S V
29	we think it is? Whether you live in a big city,			M S V	M S V
36	a gentle rural countryside, or somewhere in			M S V	M S V
48	between, you can see that there is a lot to life on			M S V	M S V
57	Earth. Take a look at the birds and butterflies.			M S V	M S V
64	Notice mountains and clouds, rocks and soils,			M S V	M S V
71	smells and sounds. Notice the refreshing shade			M S V	M S V
79	under a majestic tree. Notice the elegant smell			M S V	M S V
91	of a rose on a sunny day and the vibrant smell of			M S V	M S V
100	the air after it rains. Notice the unique sounds			M S V	M S V
108	of cackling and cawing crows and the magical			M S V	M S V
113	sound of a zipping hummingbird.			M S V	M S V

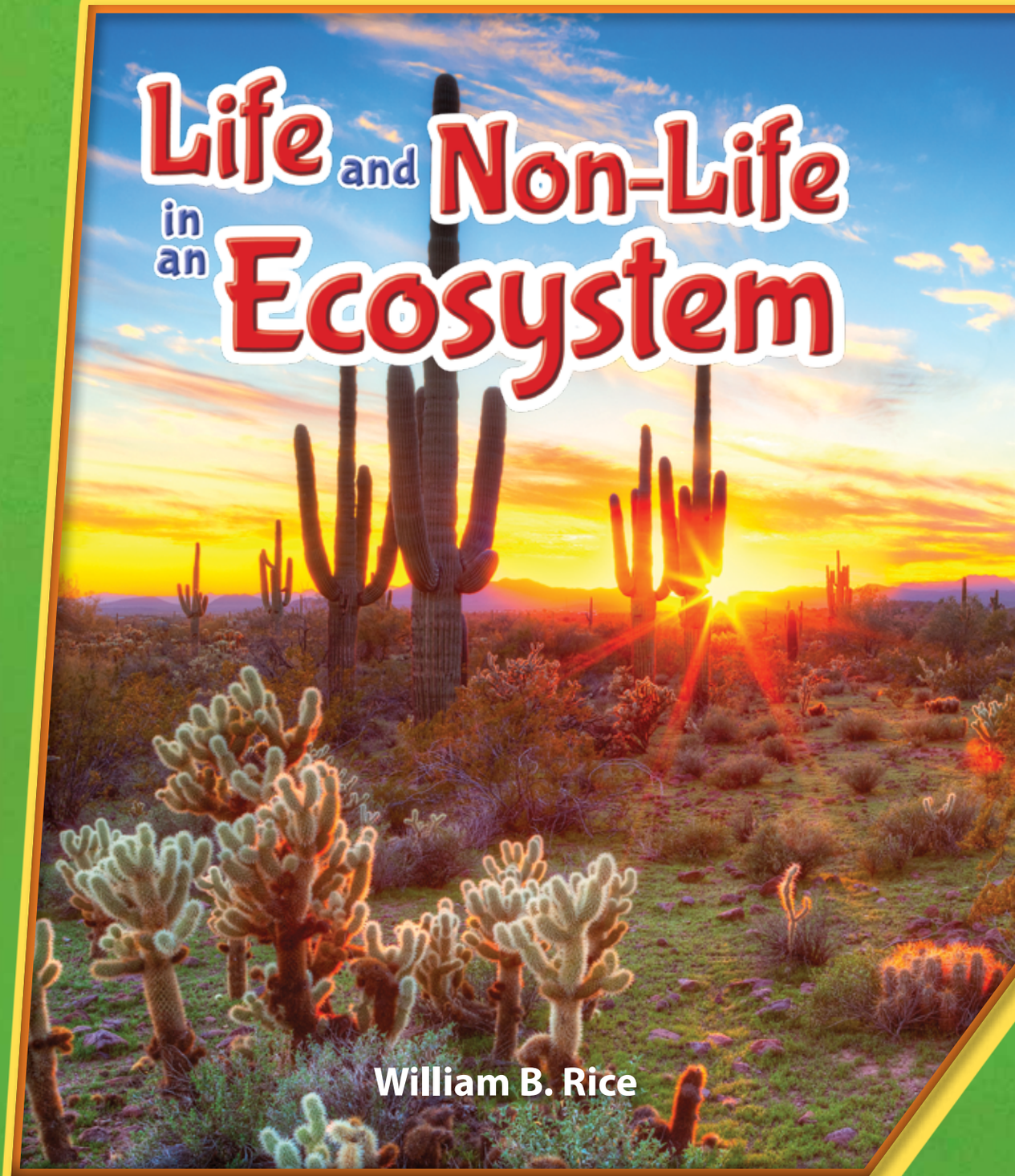
Error Rate: ☐ **Self-Correction Rate:** ☐ **Accuracy Percentage:** ☐ **Time:** ☐

Life and Non-Life in an Ecosystem



William B. Rice

Life and Non-Life in an Ecosystem



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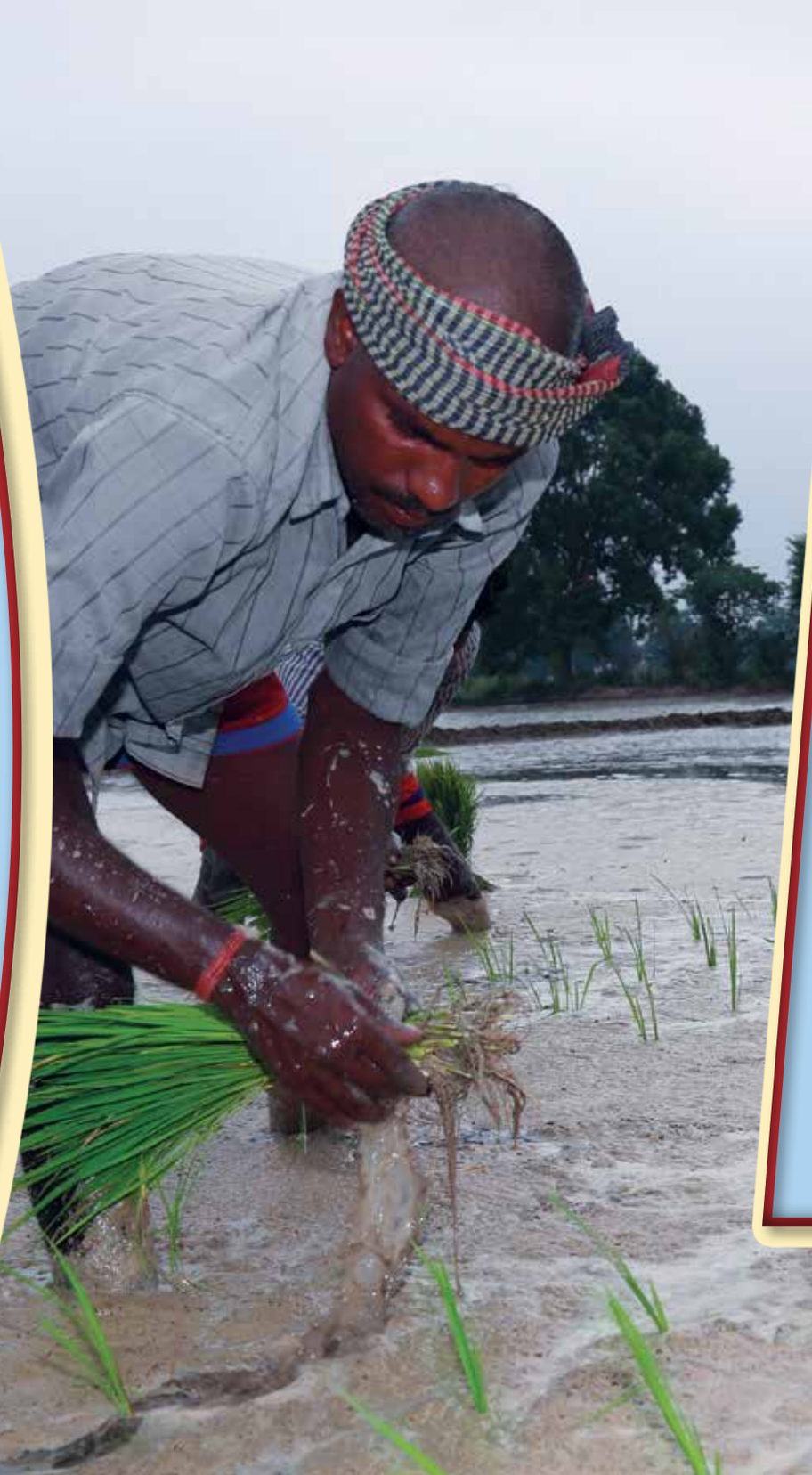


Table of Contents

Earth, Our Home

Sure, it's home. But what is it about this place called Earth that makes it as remarkable as we think it is?

Whether you live in a big city, a gentle rural countryside, or somewhere in between, you can see that there is a lot to life on Earth. Take a look at the birds and butterflies. Notice mountains and clouds, rocks and soils, smells and sounds. Notice the refreshing shade under a majestic tree. Notice the elegant smell of a rose on a sunny day and the vibrant smell of the air after it rains. Notice the unique sounds of cackling and cawing crows and the magical sound of a zipping hummingbird. Notice, too, the changing seasons throughout the year.

Life Out There

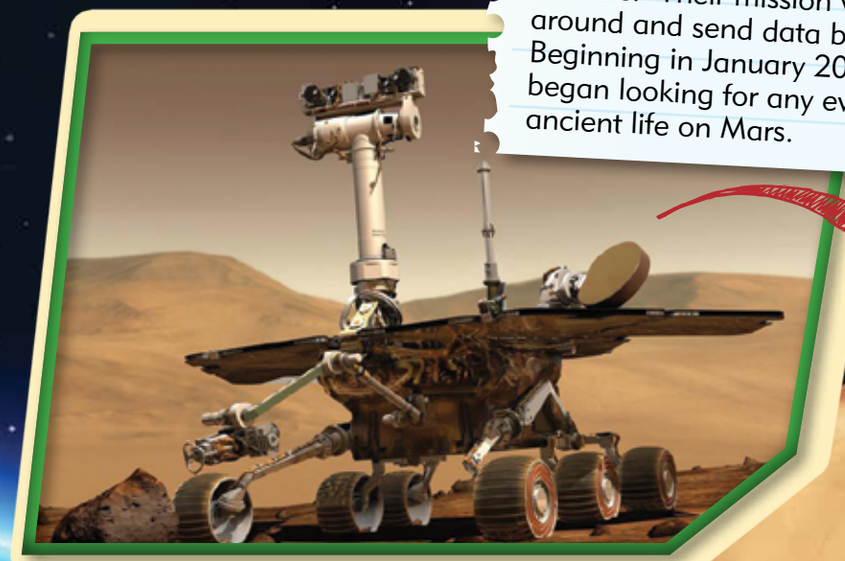
Many scientists believe that a planet must have plenty of carbon, water, and a few other elements for life to exist. Also, the planet must be the right size and distance from its star. However, we don't know for sure, as we have not found life anywhere else besides Earth.

Each of these things is noteworthy. But the importance of them is not in their beauty or usefulness. No, what makes them remarkable—what makes Earth remarkable—is the simple fact that on this planet, we have both life and non-life. And in all this vast universe, Earth is the only place *we know for sure* has this combination.

Now *that* is remarkable!

Searching for More

In 2003, NASA sent two robotic rovers to Mars. Their mission was to look around and send data back to Earth. Beginning in January 2014, the rovers began looking for any evidence of ancient life on Mars.



Developing Life

Earth wasn't always like this. Earth has undergone a lot of changes during its long existence. There was a time when Earth first formed that it was very hot and had a molten volcanic surface. There was no life.

However, over time, Earth cooled. Solid crust began forming. Liquid water began pooling. The **atmosphere** had very little oxygen and would not have been able to support creatures that are alive on Earth today. But over time, primitive **organisms** developed. They could live in these challenging conditions. These organisms began changing Earth little by little. They particularly began to change the atmosphere.

Here or There?

What we know about life comes from our studies of Earth. If life exists elsewhere in the universe, we might discover differences between life here and life there. Our definition of life may have to change.

This is what Earth may have looked like about 300 million years ago.

There are many ways this planet could have developed. But the story of how life evolved here includes all the right conditions somehow coming together. That's good news for every living thing on Earth!

What exactly makes something "living"? That is a complicated definition with many points of view. But most scientists agree on some basics. Living things…

- are complex and highly organized in their makeup.
- take in **energy** from their surroundings and use that energy.
- stay in **homeostasis**—balanced conditions internally that stay mainly the same.
- grow and develop.
- reproduce.
- respond to **stimuli**.
- evolve.
- have DNA or RNA.

In 1999, Scientists found bacteria that were 250 million years old.

Change Is Inevitable

Nonliving things can change **ecosystems**. Volcanoes are not alive, yet they can cause an environment to change completely. So can earthquakes!

Sometimes the differences between life and non-life can seem fuzzy. For example, there are nonliving things such as crystals that grow and respond to stimuli. But they are not alive. Entire books are written on just the definition of life! And every day, scientists make new discoveries. They understand life a little bit more.

No matter how we define it, we know that life developed on Earth through very particular conditions. What's more, life has affected the planet so that new life continues to evolve! For example, Earth's atmosphere today is what it is because of the life that has populated the planet over time. The atmosphere now is quite different from its earliest makeup. And life has affected Earth's **geology**. Some rocks are made of materials that were once part of living organisms!

Life and non-life in ecosystems affect each other in more ways than we know. Life depends on non-life for its existence. And non-life is changed by the existence of life. Because of this, planet Earth is an evolving system. If we could take a peek into the far distant future, who knows what we'd see!

Digging Deep

Even things as small as worms can affect nonliving things. They add air and water to soil. They also break down dead plants and turn them into matter plants can use. Worm poop is actually a fertilizer, which helps plants grow.

In Between

Viruses are a topic of debate when it comes to life. Some say they are living because they grow, evolve, and have their own DNA or RNA. But viruses do not take in energy on their own, and they can't reproduce on their own, either. Do you think they are living or nonliving?

Ebola virus

Large areas of plant life help to create an atmosphere that allows animals such as humans to live.

Soil

Soil is probably one of the most important things in an ecosystem. It is the loose dirt that is under our feet as we walk through a field or through a forest. Plants sink their roots deep into soil. Without soil, plants could not grow and live and animals would not have food.

People have been studying soils for centuries and have found that there are many different kinds of soils. Plants have **adapted** to growing in these different kinds. Soil is made up of several important parts. The parts include rock materials, pieces of dead plants and animals, liquids, air, and **microorganisms**.

Parent Soil

The small pieces of rocks and minerals that make up soil are formed out of parent material. Parent material is all of the larger rocks and minerals that become part of the soil.

Soils may take hundreds or thousands of years to form.

Desirable Traits

The best kind of soil for growing food is called *loam*. Loam is made of sand, silt, and clay. This combination of particles allows air and water to flow easily. The clay and silt hold in moisture. But the sand ensures that the plant doesn't receive too much water.

Rock Materials

First, let's look at rock materials. Where do they come from? They are actually tiny pieces of rock that have broken off larger rocks and have been washed or carried down to lower areas by wind or water. These tiny pieces of rock are nonliving materials. Humans classify them mainly by their size. Clay is the smallest class of rock particles. Next largest is silt, and still larger are sand particles. Most soils have some particles from each of these groups. These particles provide soils with structure and support for the other soil parts. These particles also provide minerals and **nutrients** for plants and organisms to use for life and growth processes.

Decomposers

Soil is not only made up of tiny rock particles. It's also made up of small pieces of dead plants and animals. When a plant or animal dies, it falls to the ground. Plant parts such as dead leaves and branches also fall. They begin to decay and **decompose**, or fall apart. Decomposers, an important part of any ecosystem, actually break this matter down. Decomposers are mainly bugs and microorganisms. Soils are filled with these organisms. They include bacteria and fungi. Fungi are a common group of organisms that include yeast, molds, and **mycelia**. You've probably seen mold growing on cheese or bread that has been kept too long. And you probably know mycelia better by its fruit—mushrooms. Mycelia are underground organisms that form vast networks of **filaments** in soil. When the time is right, they grow mushrooms.

Moldy Goodness

Even though mold is usually bad for you, some types of mold are used in things we eat! Mold is used to make certain types of cheese, such as bleu cheese. It is also used in antibiotics such as penicillin.

Microorganism is short for microscopic organism.

exposed mycelia network

Small but Important

Soil contains much more than meets the eye. It holds water and living organisms. You can find more microorganisms in a teaspoon of soil than there are people on Earth!

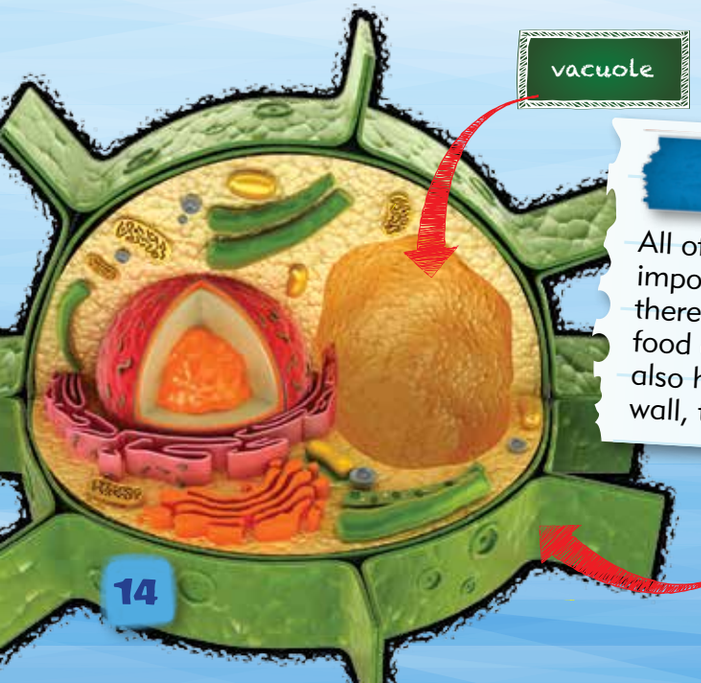
Instead of seeds, mushrooms have spores. Spores are released from mushrooms back to the ground. They begin to grow new filaments. They connect with other filaments to form new mycelia networks. As they do this, they break down rocks. They also decompose dead plants and animals and make nutrients available for plants to use. In addition, mycelia use minerals that come from the tiny rock pieces. They use energy and nutrients from dead plants and animals as well.

Water and Air

Water and air are also important nonliving parts of soil. Water is a special component that is used by just about every life form on Earth. Many scientists believe that water may be the most critical need of living things.

Water is needed by plants to grow and live. Plants use water for **photosynthesis**. They also use it to move nutrients within their plant bodies. Water occupies almost all of the space within plant **cells**. Water pressure in plants helps them stay upright. It also helps to orient their leaves to receive sunlight.

Within soil, water dissolves minerals and nutrients from rock particles. It also dissolves them from dead plant and animal materials. At the same time, these particles and materials provide structure and space for water.



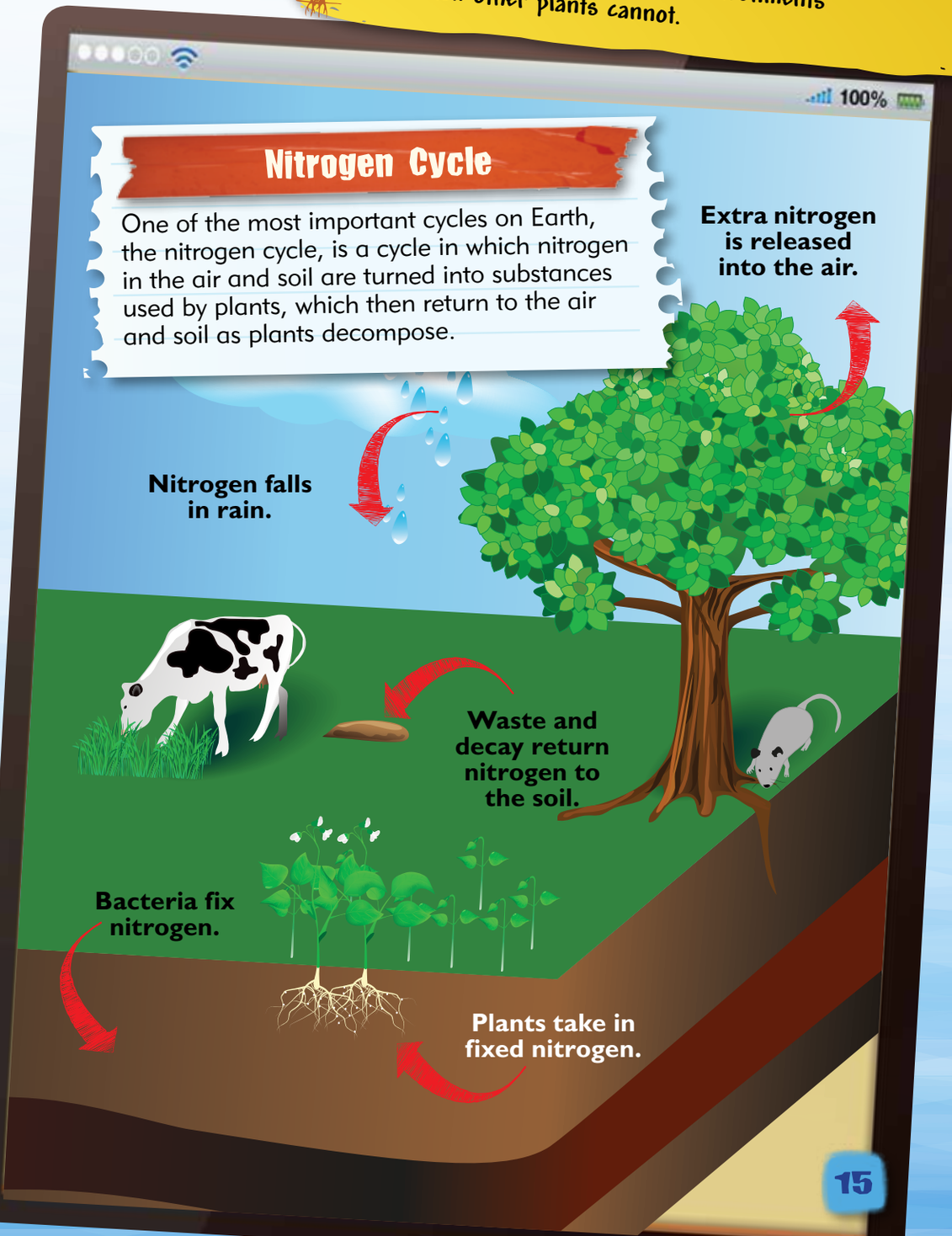
Plant Cells

All of the cells in a living thing have an important job to fulfill. In plant cells, there is a large vacuole that stores food and nutrients for plants. They also have a cell wall. Without the cell wall, the plant would collapse.

Spores can survive in harsh environments in which other plants cannot.

Nitrogen Cycle

One of the most important cycles on Earth, the nitrogen cycle, is a cycle in which nitrogen in the air and soil are turned into substances used by plants, which then return to the air and soil as plants decompose.

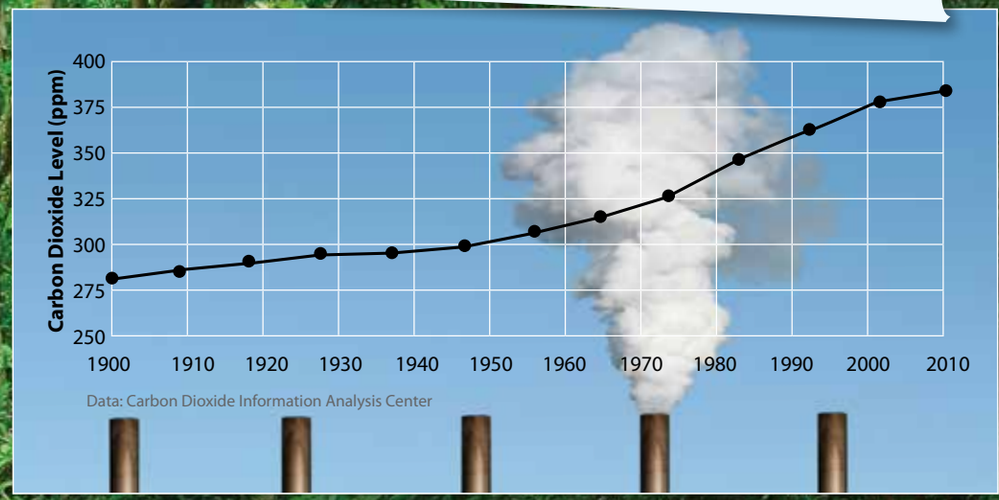


Air is also found in soil. On average, soil contains 25 percent oxygen. Microorganisms living in soil require oxygen to live. Our bodies also need oxygen to work properly. We breathe in oxygen from the air around us. Oxygen taken in by our lungs allows our bodies to function properly. When we eat food, our cells produce energy. These cells are fueled by oxygen. Plants need carbon dioxide to work properly. Plants get carbon dioxide from the air in soil as well as the air above ground. The roots of plants not only take in water from the soil, but they also take in oxygen.

We breathe in oxygen and breathe out carbon dioxide. Plants breathe in carbon dioxide and breathe out oxygen. Carbon dioxide is also released from dead plant and animal tissues. Some of this carbon dioxide is found in soils and is used by plants. This exchange is a great partnership! It demonstrates very well the interdependencies of living and nonliving things.

Increasing CO_2

Carbon dioxide holds heat in the environment. Usually, this helps moderate temperatures. But in 2010, scientists found that soil and plants have been releasing more carbon dioxide than they have in the past.



Data: Carbon Dioxide Information Analysis Center

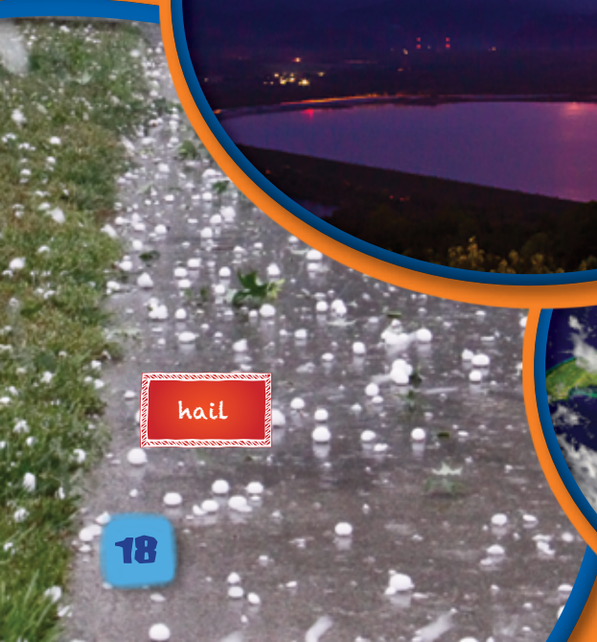
Without plants, human beings would not have the oxygen they need to breathe.

About 50 percent of soil is air and water.

The Atmosphere

The atmosphere is the layer of air that surrounds Earth. It is also another key nonliving thing that affects all life in Earth's ecosystems. It is mainly made of nitrogen and oxygen. A small percentage is water vapor.

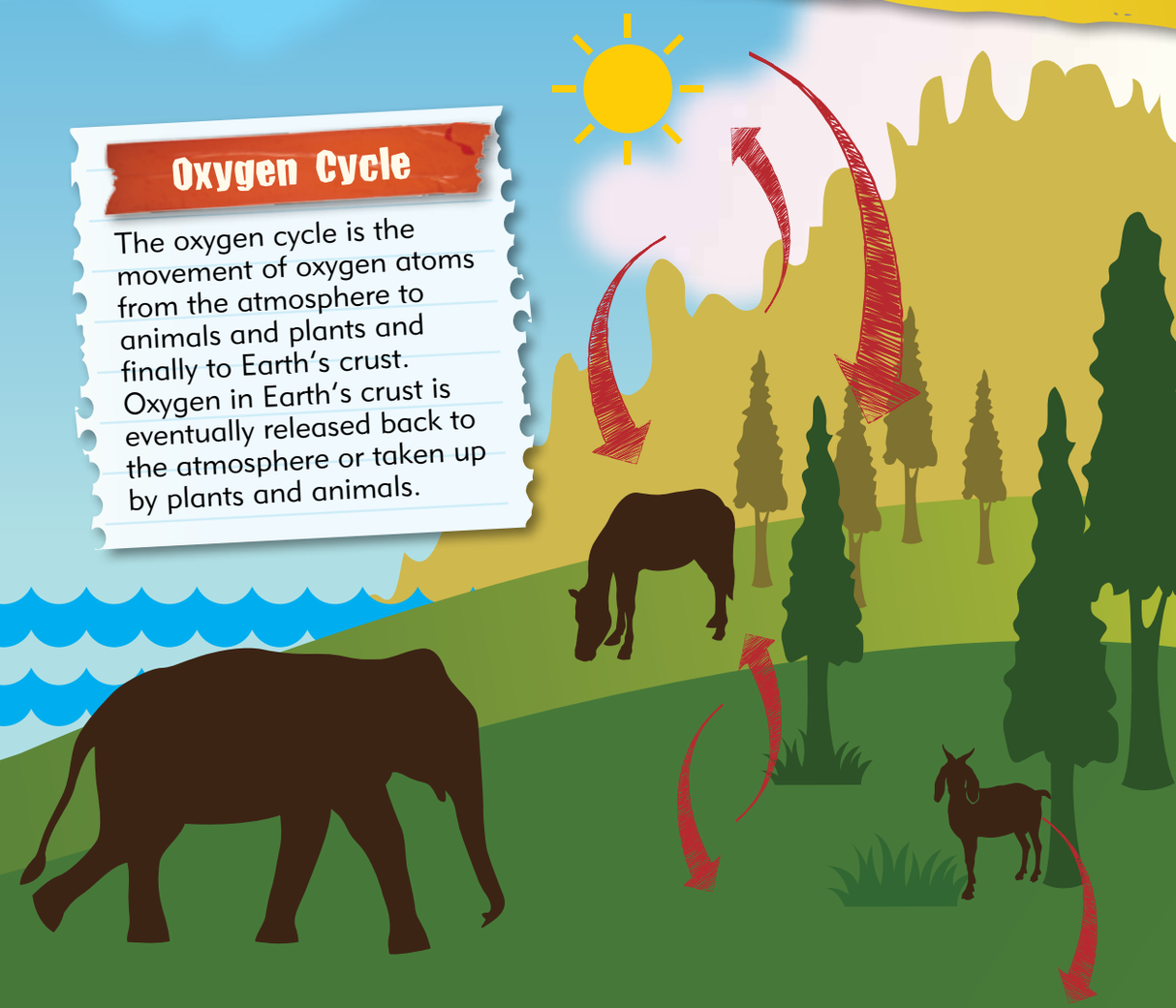
The processes that occur in Earth's atmosphere affect all types of ecosystems. As we know, an important part of Earth's atmosphere is oxygen. Animals need oxygen to live. We breathe it in without even thinking about it. Our bodies use this oxygen for many of our normal life processes. The atmosphere also has carbon dioxide. Plants need it just like we need oxygen. Plant cells use carbon dioxide to turn sunlight and water into food.



Fish breathe oxygen even though they live underwater.

Oxygen Cycle

The oxygen cycle is the movement of oxygen atoms from the atmosphere to animals and plants and finally to Earth's crust. Oxygen in Earth's crust is eventually released back to the atmosphere or taken up by plants and animals.



The most noticeable process in the atmosphere is weather. The atmosphere holds a lot of energy and heat. This energy and heat are spread unevenly. Because of this, there are winds and currents that carry the water vapor all over Earth. This makes storms of all sizes, from small storms to hurricanes. In each storm, water vapor falls to Earth as rain, snow, hail, or sleet. This brings water to ecosystems so plants and animals can use it.

Energy in the atmosphere also affects how warm or cold it is. In some ecosystems, such as the poles, it is cold most of the year. Ecosystems around the equator are mostly warm or hot all year. The ecosystems in between have periods of hotter and colder weather. These mainly depend on the seasons.

The usual type of weather in a place is its climate. Climate is based in part on the patterns of temperatures and **precipitation**. These patterns affect plants and animals. Certain kinds of each have adapted to live in different climates. Tropical climates are usually warm and rainy throughout the year. The plants and animals that live there need a lot of water and a pleasant temperature. The plants and animals that live in arid climates have evolved to thrive with little water and extreme heat and cold.

Humans have become so numerous and active that we affect Earth's atmosphere and climate. We have used fossil fuels in many ways. This has released carbon dioxide and other gases at a faster rate than they can be used. These gases cause the atmosphere to keep more heat than it has in the past. The extra heat is beginning to cause changes in climate and weather. These changes include stronger storms, hotter temperatures, and extreme dryness or drought.

Average world temperatures have increased by around 1° Celsius (1.8° Fahrenheit) in the 20th century.

There are many different types of climates.

Mediterranean climate

tropical climate

arid climate

This mountain peak in Colorado is an example of sunshine hitting one side of the mountain more than the other.

Location, Location, Location

An important condition for life in ecosystems includes orientation to the sun. Orientation is how a land feature is situated compared to the sun's rays. Here is an example: Imagine that a mountain has a north-facing and a south-facing slope. In North America, the south-facing slope gets more direct sunlight than the north-facing slope. Because of this, snow will stay on the north-facing slope longer than it does on the south-facing slope. More of the snowmelt also seeps into the soil on the south-facing slope. This is because it gets more sun, the snow melts sooner, and more water evaporates back into the atmosphere. One side gets and maintains much more water than the other side does. Because of this, there are different kinds of soils and different kinds of plants and animals on each slope, even though it's the same mountain. One slope has more water, and one has less; one has more sun, and one has less. The ecosystems on each slope are therefore quite different.

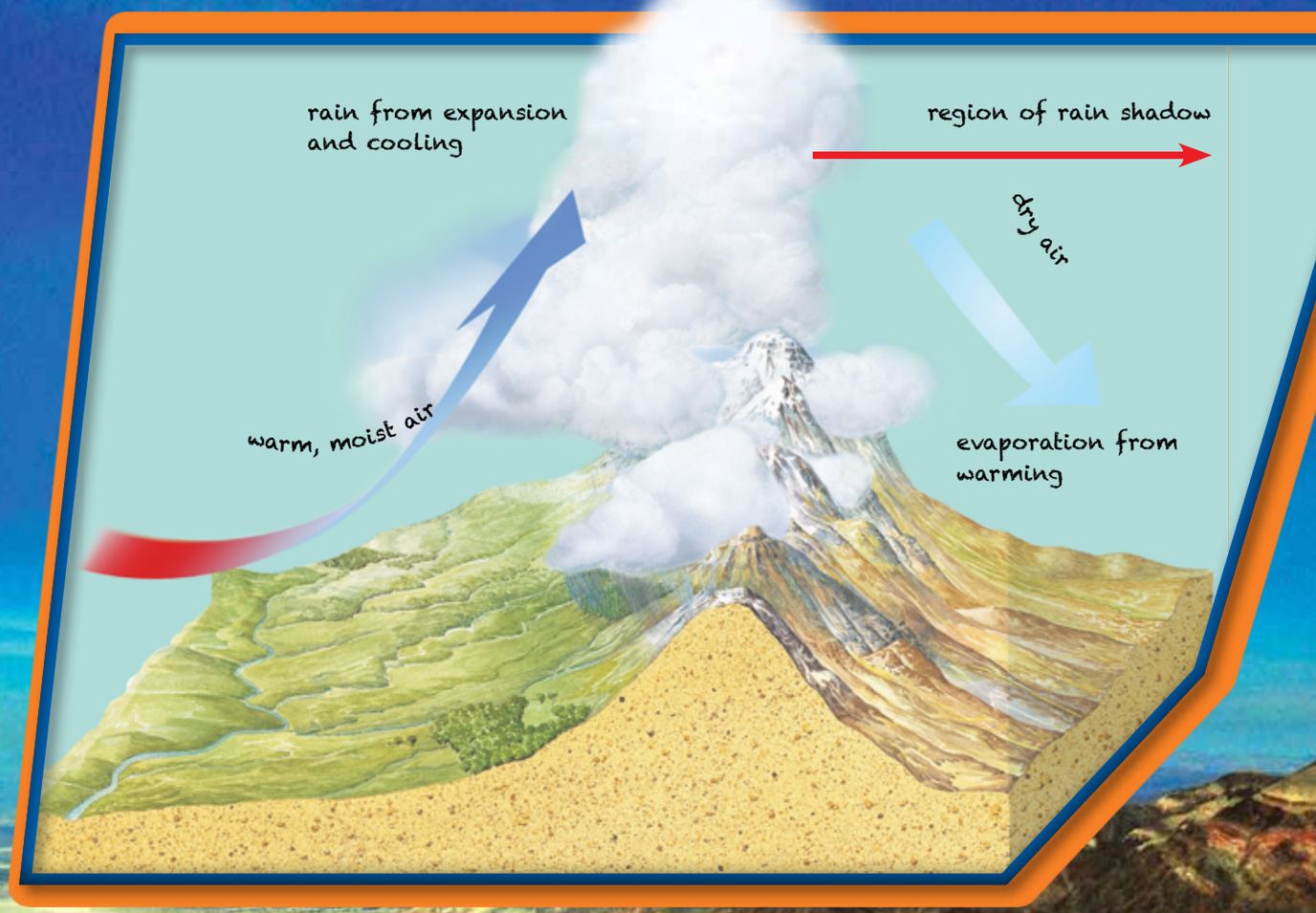
Adapting

Mountain goats have adapted to the various temperatures of mountain climates. Their thick coats protect them from the cold in winter. They shed these coats in the summer when it gets warmer.

Mountains, because they are so tall, intercept moisture in the atmosphere. There is more rain on one side of the mountain. The region that receives less rain is called the *rain shadow*. Death Valley, located in California, is a desert that is hot and dry because of a rain shadow. Succulents, cactuses, jackrabbits, and mountain lions reside here. On the other side of the mountain, there is much less water and more dry areas—even deserts.

At the equator, there is more direct sunlight than at Earth's North and South poles. This significantly affects the climate and weather patterns. The climate at the equator is hot and has rain. Here, camels, tarantulas, and antelope roam. The climate is much colder and has a lot less rain at the North and South poles. The Arctic fox, snowy owl, and reindeer live here. In between the tropics and poles, there are varying climates due to the seasons and wind patterns. In some places, there is more water than others. Some areas can be extremely dry deserts. Some areas can get very cold.

Elevation also plays a big role in the life and non-life found in ecosystems. Higher in the mountains, it is generally cooler with more precipitation. There is also less oxygen. The plants and animals have evolved and adapted to thrive in these conditions.



Death Valley

A Healthy Planet

Interdependence is key when studying both life and non-life on Earth. It is certain that life depends on non-life in order to live. Air, water, soil, and more are crucial to the ability to live and live well. And while non-life doesn't depend on life to exist, it is affected by living things.

But more than other living things, humans have the most ability to affect and alter the planet. It is an interesting irony that while we depend on Earth conditions to be exactly as they are in order to live, we can also be careless in how we treat the planet. We often take resources for granted and use more than we need. We easily forget that the conditions of our planet support us. We sometimes alter them without care or thought for the future.

Our home planet evolves all the time, as does life. Change is not a bad thing. But change that alters life processes can be harmful. It can harm not only Earth but ultimately the human race. In the interdependence equation, life and non-life must stay in balance. And that equals a healthy planet for every living thing.

Electric vehicles help reduce the carbon dioxide released into the atmosphere.

Think Like a Scientist

How do life and non-life affect each other? Experiment and find out!

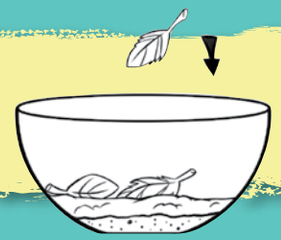
What to Get

- 5–6 earthworms
- dark paper or cloth
- gardening gloves
- gardening soil
- large glass container with a lid, such as a bowl or an aquarium
- leaves
- sand
- water

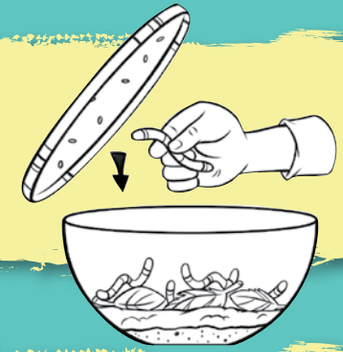
What to Do

1. Moisten the soil and sand. Flatten the sand at the bottom of the container.

2. Flatten the soil above the sand. Place leaves on top of the soil.



3. Gently set the worms on top of the leaves and place the lid on the container. Be sure there are air holes.



4. Cover the sides of the container with dark paper or cloth so that it is dark inside the container. Each day, lift the paper or cloth to see inside. (Be sure to keep the sand and soil moistened so it doesn't dry out.) Make notes and take pictures of the changes you see each day. What do you notice?

Glossary

adapted—changed so that it is easier to live in a particular place

atmosphere—the mass of air that surrounds Earth

cells—basic units of life

decompose—to slowly break down and decay

ecosystems—communities of living and nonliving things in particular environments

energy—power that can be used to do something

filaments—thin, threadlike fibers

geology—the study of rocks and other substances that make up Earth's surface

homeostasis—a relatively stable state of equilibrium

microorganisms—tiny living things that can only been seen through a microscope

mycelia—the plant body of fungi, made of a mass of branching filaments that spread through soil

nutrients—substances that living things need to grow

organisms—living things

photosynthesis—the process in which plants use sunlight to combine water and carbon dioxide to make their own food (glucose)

precipitation—water that falls to the ground as rain, snow, sleet, or hail

stimuli—things that cause a change or a reaction

Index

Your Turn!

Water, Water Everywhere

Water is one of the most essential nonliving things that supports life. Take a notebook and jot down all the signs of water you see in a single day. Also note how living things use the water. What can you determine about water from what you see?

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