

3rd Grade Science - Day 1

Standard:

3.L.5 The student will demonstrate an understanding of how the characteristics and changes in environments and habitats affect the diversity of organisms.

Performance Indicator:

3.L.5A.1 Analyze and interpret data about the characteristics of environments (including salt and fresh water, deserts, grasslands, forests, rain forests, and polar lands) to describe how the environment supports a variety of organisms.

I Can...

☒ I can describe a habitat and why it is important for all life.

Essential Question:

☐ Why does a plant or animal live in a specific habitat?

Engage:

Read the article "Where Animals Live" to understand what a habitat is.

Read the article "Why Organisms Need a Habitat" to understand why animals live where they do.

Complete the writing assignment to explain why all living things need a habitat to survive.

Draw a picture of an animal and its habitat. Label the name of the animal and the habitat.

The place where an animal lives is called its **habitat**. A habitat has many things an animal needs to survive. Think about your habitat. You might live in a house or an apartment. Your habitat gives you shelter from harmful weather. It is also a place for you to sleep. You probably have food and water in your habitat. Other people might live in your habitat with you.

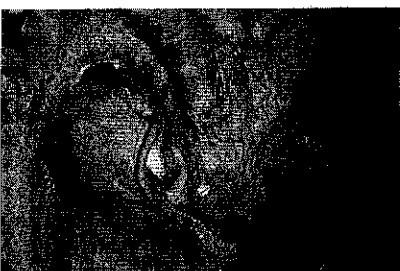
All living things have habitats. Habitats must meet the needs of the things that live in them. All living things need food, water, and shelter. For example, an octopus lives in the ocean. The ocean is a **marine** habitat. An octopus is surrounded by water in its marine habitat. It finds shelter under rocks and in caves in its habitat. It eats crabs, clams, and fish that also live in the marine habitat.

A squirrel lives in a forest habitat. A forest habitat has many kinds of trees and shrubs. A squirrel gets food from trees and shrubs. For example, a squirrel eats acorns from oak trees and blackberries from blackberry bushes. A squirrel might find shelter in a hole in a tree trunk. It drinks water from puddles or streams in its forest habitat.

Habitats must meet the needs of the organisms that live in them.



An octopus lives in a marine habitat.



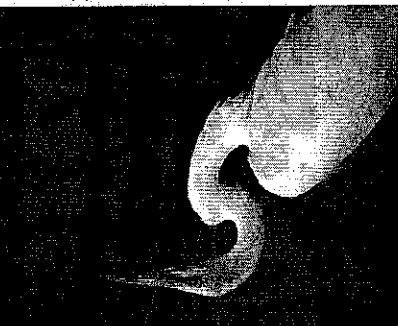
Why Organisms Need a Habitat

The place where an organism lives is called its **habitat**. For example, a forest might be a habitat for deer. A swamp might be a habitat for frogs. Many crayfish live in **stream** habitats. An egret is a large bird that lives in **wetland** habitats. Wetlands are areas that are covered by shallow water for part of the year. Marshes and swamps are examples of wetlands. Habitats include both living and nonliving parts. The living things in a wetland include birds, fish, frogs, and insects. The nonliving things include water, soil, sunlight, and air.

Egrets feed on fish, frogs, and insects in their habitat. They make nests out of twigs from plants in their habitat. Egrets drink water from the wetland and wade in the water as they search for food. They also breathe in oxygen gas from the air.

An organism's habitat has the things it needs to survive. All organisms need food, water, and shelter. An egret gets all these things from its wetland habitat. It eats plants and insects that live living in a stream habitat. Crayfish breathe in oxygen from the water. They hide under rocks in the stream for shelter. The stream habitat has all the things a crayfish needs to survive.

What happens if a habitat does not meet the needs of an organism? Polar bears live in cold, snowy habitats. They have thick fur and a layer of fat to keep them warm. Polar bears live on land, but they spend a lot of time in the ocean. Polar bears swim in the ocean to hunt and eat seals, walrus, and whales. What would happen if we moved a polar bear to the desert? A polar bear would not be able to live in the desert. The polar bear would be too hot and would not have enough water to drink. In addition, it would not have food from the ocean to eat. If an organism is in a habitat that does not meet its needs, the organism must move to a habitat that fits its needs better or it will die.



An egret lives in a wetland habitat.



The habitat of this crayfish is a stream.

Date _____

Directions: Take 10 minutes to complete the writing assignment on the assignment sheet.

Write About it

Why do all living things need a habitat to survive? Give examples of 2 animals, their habitats, and why they live there.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Directions: Draw a picture of an animal and its habitat. Be sure to include the name of your animal and the name of the habitat in your drawing.

Name _____ Date _____

3rd Grade Science - Day 2

Standard:

3.L.5 The student will demonstrate an understanding of how the characteristics and changes in environments and habitats affect the diversity of organisms.

Performance Indicator:

3.L.5A.1 Analyze and interpret data about the characteristics of environments (including salt and fresh water, deserts, grasslands, forests, rain forests, and polar lands) to describe how the environment supports a variety of organisms.

I Can...

- ☐ I can identify salt water and fresh water environments.
- ☐ I can analyze data about the characteristics of salt water and fresh water environments.
- ☐ I can describe how the salt water and fresh water environments support a variety of organisms.

Essential Questions:

- ☐ What characteristics of salt water and fresh water environments impact the organisms that live there?
- ☐ How can changes in salt water and fresh water habitats be beneficial or harmful to the organisms that live there?

Engage:

Salt Water and Fresh Water notes – these will give you an overview of what your child should know by the end of the lesson. Any information not in the articles will be here for you to go over with your child.

Read the article “Earth’s Fresh Water Bodies” to learn about what fresh water environments are and where they are located in the world.

Read the article “Earth’s Oceans” to learn about what salt water environments are and where they are located in the world.

Complete the map activity to locate fresh water and salt water environments within South Carolina.

Complete the writing activity to compare and contrast fresh water and salt water environments.

Life Science: Environments and Habitat Notes

Day 2

Salt & Fresh Water Habitats

Salt Water:

- Oceans are large bodies of salt water divided by continents. Since ocean water is constantly moving, the characteristics of the water are constantly changing. The amount of sunlight varies by depth. Hence temperature also varies by depth. The amount of salt, other minerals and additives also varies based on what lives within the water and sometimes what pollution has been placed in the water.
- Most organisms live in the shallow portion of the ocean because sunlight can penetrate to keep the water warm, and food is abundant. Some examples of organisms that live in the shallow parts of the ocean are drifters (jellyfish or seaweed), swimmers (fish), crawlers (crabs), and those anchored to the seafloor (corals).
- Some organisms live in the open ocean, near the surface of the ocean, or in the deep ocean bottom. Plankton float in the upper regions of the water. Some organisms swim to the surface for food or air (whales, turtles, dolphins) while other organisms stay closer to the bottom of the ocean (octopus).

Estuaries:

- **Estuaries** are found where freshwater rivers and saltwater meets. Estuaries are saltier than a river, but not as salty as the ocean. The amount of salt (salinity) changes with the tides. Estuaries contain salt marshes with grasses and marsh plants adapted to this changing water. Examples of animals that live in the estuaries/salt marshes include crabs, shrimp, birds (i.e., blue heron and egrets), and muskrats.

Fresh Water:

- Lakes and ponds** are bodies of freshwater that are surrounded by land. Ponds are usually shallower than lakes and the temperature of the water usually stays the same from top to bottom. Plants and algae usually grow along the edges where the water is shallow. Examples of animals that live in fresh water include fish, amphibians, ducks, turtles, or beavers.

Rivers and streams are moving bodies of water that can be found in warm or cold areas.

- The water in rivers and streams can be fast or slow moving.
- The speed of the water flow determines the types of plants and animals that live in or use the rivers and streams.
- There are many plants (bushes and trees) along the banks as well as plants growing in the water.
- Many animals (i.e., fish, crayfish, snakes, worms, and insects) use these plants for food or shelter. Swamps are located in areas with warm temperatures.
- Since swamps have thick plant growth such as ferns and reeds, small bushes and small trees do not thrive due to lack of sunlight.

- The surviving trees are very tall, reaching for sunlight. Standing water causes the trunks of the trees to spread out to provide support.
- For example, the cypress, a tree found in the swamp has "knees," or roots that come to the surface for oxygen.
- The animals that live in the swamp are very adapted to a water environment (i.e., alligators, turtles, ducks, and egrets).

Earth's Freshwater Bodies

The water that falls to Earth as rain is **freshwater**. This means that it is not salty. Freshwater is the kind of water we use every day for drinking, cooking, and bathing. The water in almost all lakes, rivers, and streams is also freshwater.

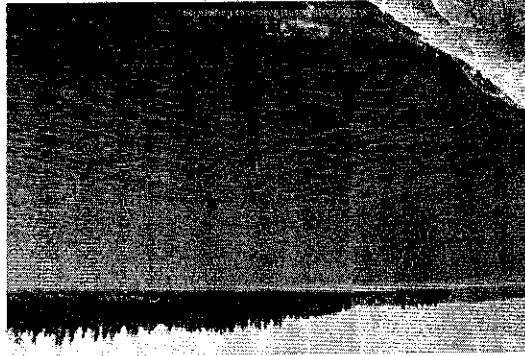
When rain falls to the ground, some of it seeps into the soil. But some water stays on Earth's surface. This water is called **runoff**. Runoff flows over land from higher ground to lower ground. Streams form as runoff flows over land. As streams flow downhill, they combine with other streams to form rivers. Rivers eventually flow into oceans.

The area where a river flows into an ocean is called a **mouth**. The flowing water of a river tends to slow down at the mouth. Small pieces of rock and other material settle around the mouth. As more and more material settles over time, an area called a **delta** forms.

The Nile River delta is one of the largest in the world.



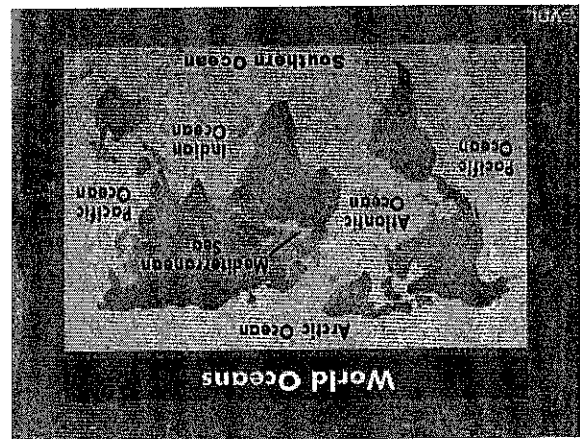
Runoff can also flow to an area that is lower than the surrounding land. When this happens, a pond or lake forms. Ponds and lakes are pools of freshwater. They are places where runoff collects. They do not flow over land to rivers or oceans. Ponds are generally smaller than lakes. A few lakes have salt water instead of freshwater.



Lake Superior is the largest lake on Earth.

Earth's Oceans

Did you know that most of Earth is covered with **water**? Some of the water on Earth is in rivers and lakes. However, most of Earth's water is in the oceans.

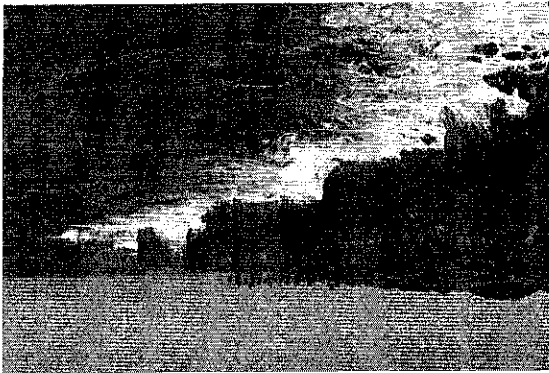


Most of the water on Earth is in the oceans.

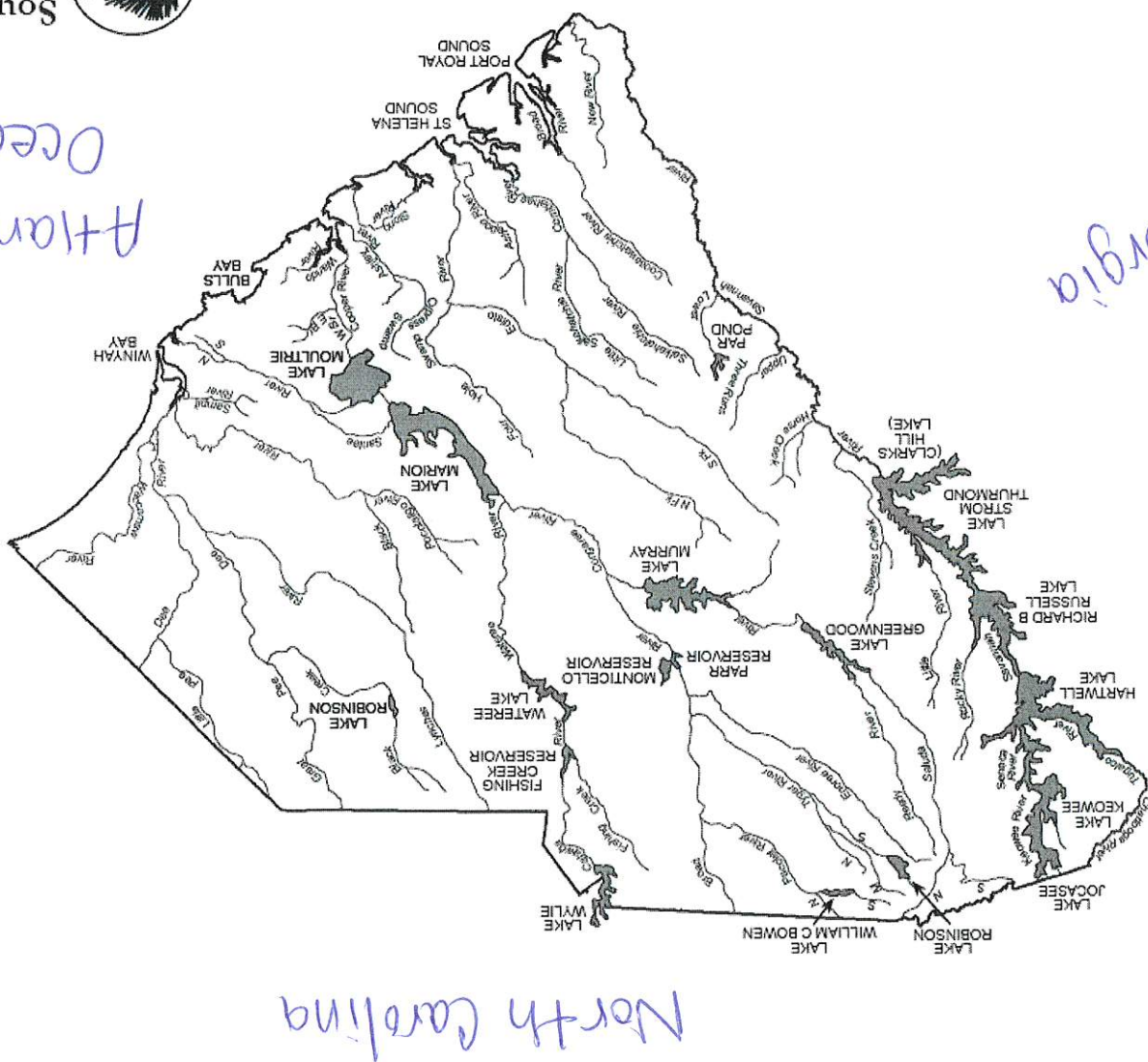
Oceans are low areas on Earth that are filled with salty water. Five oceans cover more than half of Earth's surface. These oceans are the Atlantic, Pacific, Indian, Arctic, and Southern Oceans. Scientists named the Southern Ocean in the year 2000.

What do you think the bottom of an ocean looks like? Is it smooth and flat like a beach? The bottom of the ocean is actually a lot like the land you can see. Some places are flat. These places are called *ocean plains*. Other places have mountains. Many ocean mountains are completely under water. However, some tall ocean mountains reach above the surface. When this happens, they can form islands.

The tallest ocean mountain in the world is in Hawaii.



Georgia



green crayon to color in the salt water habitats.

Date _____

Directions: Take 10 minutes to complete the writing assignment on the assignment sheet.

Write About it

How are fresh water habitats and salt water habitats similar? How are they different?

Date

Name

3rd Grade Science - Day 3

Standard:

3.L.5 The student will demonstrate an understanding of how the characteristics and changes in environments and habitats affect the diversity of organisms.

Performance Indicator:

3.L.5A.1 Analyze and interpret data about the characteristics of environments (including salt and fresh water, deserts, grasslands, forests, rain forests, and polar lands) to describe how the environment supports a variety of organisms.

I Can...

- ☒ I can identify desert and polar environments.
- ☒ I can analyze data about the characteristics of desert and polar environments.
- ☒ I can describe how desert and polar environments support a variety of organisms.

Essential Questions:

- ☐ What characteristics of desert and polar environments impact the organisms that live there?
- ☐ How can changes in desert and polar habitats be beneficial or harmful to the organisms that live there?

Engage:

Desert and Polar notes – these will give you an overview of what your child should know by the end of the lesson. Any information not in the articles will be here for you to go over with your child.

Read the article "Extreme Climate Zones: Polar and Desert" to learn about what polar and desert environments are and where they are located in the world.

Complete the writing activity to compare and contrast desert and polar environments.

Draw a picture of 1 desert animal or plant and 1 polar animal or plant. Explain why that organism can survive in that habitat.

Life Science: Environments and Habitat Notes

Day 3

Desert Habitat

Deserts:

- Are dry with extreme temperature ranges.
- Some deserts are covered with sand. In some deserts during the day, it is very hot, whereas the nights are very cold.
- Most of the plants (i.e., cacti) and animals (i.e., lizards, scorpions, and rabbits) have ways to conserve moisture; are able to go long periods without water, or can withstand the extreme temperature changes.
- Most of the animals are active during the night when temperatures are cooler.

Life Science: Environments and Habitat Notes

Day 3

Polar Lands Habitat

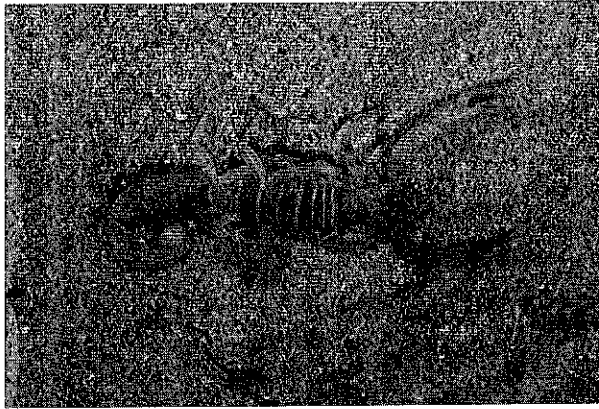
- Polar lands are usually very cold and the amount of daylight varies throughout the year.
- Winters are mostly dark with only moonlight and starlight, whereas, in the summers, there 12 are up to 24 hours of daylight. There is little variety of plant life (mosses, for example).
- Animals that live in the polar region (for example, reindeer, seals, polar bears, arctic foxes, and penguins) are adapted to these conditions by having extra fat or thick fur for insulation. Having extra fat or thick fur for insulation.

Extreme Climate Zones: Polar and Desert

When you hear the words *extreme climate*, what comes to mind? Do you think of really hot **temperatures**? Are you imagining a frozen land covered in snow? Two of Earth's climate zones could be considered extreme. They are the **desert zone** and the *polar zone*.

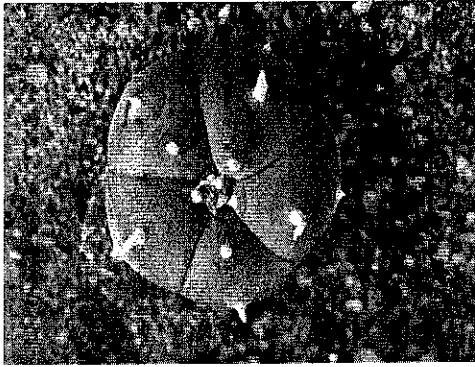
Desert Zone

What does a desert mean to you? Most people think of extreme heat. But temperatures in the desert zone can be hot or cold. So what makes this zone extreme? It is very dry. Little **precipitation** falls each year. As you would guess, this affects the kinds of plants and animals that live in this zone. They have to be able to survive without much water. Some plants, like cacti, have special roots to collect as much water as possible. Many animals are active at night when temperatures are cooler.



Scorpions live in the desert zone.

The Sahara in Africa is in the desert zone. It is the world's largest desert. It is also one of the hottest areas on Earth. Average yearly temperatures are above 30° Celsius. That's above about 86° Fahrenheit! But temperatures can fall below freezing in the winter.



Small cactus plants grow in the Sahara.

The polar zone is another extreme climate zone. As the name suggests, this zone has very cold temperatures. Even summers do not bring much relief from the cold. Yearly precipitation is generally light. Water is hard to find. Plants and animals that live in polar climates must be able to

Extreme Climate Zones: Polar and Desert

survive harsh conditions. Plants that grow here are usually pretty small. They don't need much water. Many animals, like bears, have thick layers of fat and fur. Other animals, like birds, migrate south in the winter.

Antarctica is in the polar zone. It is a large land mass at the South Pole.

Antarctica is covered by permanently frozen ground called permafrost. It is one of the coldest places on Earth. A temperature of -88° Celsius was recorded there. That's around -129° Fahrenheit. Now that's extreme!

The desert zone and the polar zone are only two climate zones. Earth has five zones in all. Each zone has its own general **weather** patterns. And each zone has its own typical plant and animal life. With all of these different climate zones, imagine all the diversity of life on Earth!



Animals like polar bears live in the polar zone.

How are desert and polar habitats similar? How are they different?

Write About it

Directions: Take 10 minutes to complete the writing assignment on the assignment sheet.

Name

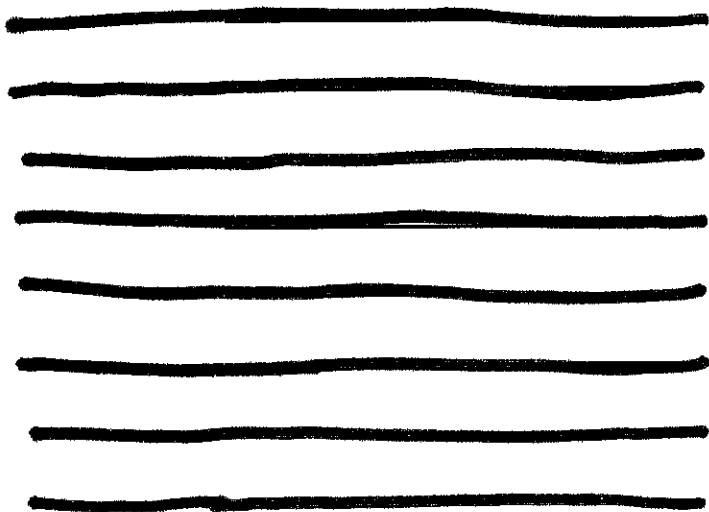
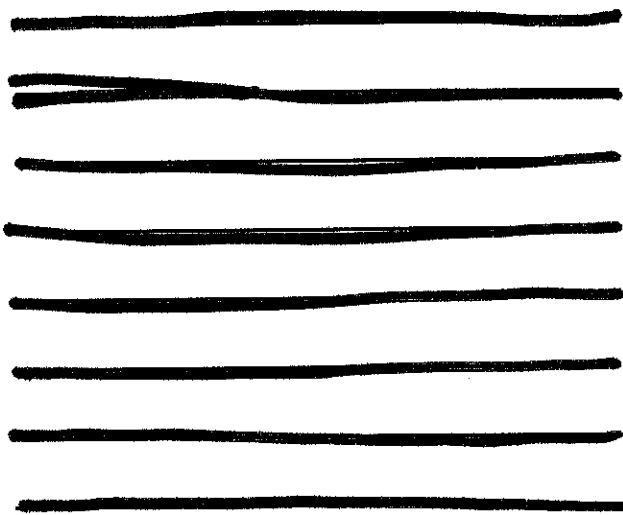
Date

Directions: Draw a picture of 1 desert plant or animal and explain why it can live in that habitat. Draw a picture of 1 polar plant or animal and explain why it can live in that habitat.

Name _____ Date _____

Desert

Polar



3rd Grade Science - Day 4

Standard:

3.L.5 The student will demonstrate an understanding of how the characteristics and changes in environments and habitats affect the diversity of organisms.

Performance Indicator:

3.L.5A.1 Analyze and interpret data about the characteristics of environments (including salt and fresh water, deserts, grasslands, forests, rain forests, and polar lands) to describe how the environment supports a variety of organisms.

I Can...

- ☒ I can identify grasslands environments.
- ☒ I can analyze data about the characteristics of grassland environments.
- ☒ I can describe how grassland environments support a variety of organisms.

Essential Questions:

- ☐ What characteristics of grassland environments impact the organisms that live there?
- ☐ How can changes in grassland habitats be beneficial or harmful to the organisms that live there?

Engage:

Grassland Notes – these will give you an overview of what your child should know by the end of the lesson. Any information not in the articles will be here for you to go over with your child.

Read the article “The Grasslands” to learn about what grassland environments are and where they are located in the world.

Box and Bullet the article “The Grasslands” then write a summary.

Instructions on how to Box and Bullet:

In the box at the top of the page, your child will write in the central (main) idea of the text. As your child reads the passage, he/she will make bullets under the box and write the details that support the central (main) idea.

Life Science: Environments and Habitat Notes

Day 4

Grassland Habitat

Grasslands:

- Have fertile soil and are covered with tall grasses.
- They usually get a moderate amount of rain, but less than forests.
- Temperatures may also vary depending on where the grassland is located.
- Some examples of animals that live in the grasslands are prairie dogs, bison, and grasshoppers.

The Grasslands



In South America, they're called pampas. In Asia, they're steppes. In Africa, they're savannas. In North America, grasslands are known as prairies. No matter what they are called, they all have one thing in common. Their vegetation is primarily grass! The amount of rainfall an area receives and the length of the rainy season limit where grasslands are found.

Tropical grasslands are found in the southern hemisphere. During the rainy season, the rainfall is 20-50 inches (50-130 cm). The rest of the year is very dry. The grasses here can grow more than seven feet tall. Their roots can grow several

feet into the ground. Tropical grasslands are warm all year. The African savanna is tropical grassland. Rhinos, gazelles, elephants, and zebras graze on the grasses growing there. Carnivores such as lions and cheetahs hide in the grass to sneak up on their prey. Animals large and small find shelter and safety in the grass.

Temperate grasslands are found on every continent except Antarctica. The rainfall in these grasslands averages between 10-30 in (25-75 cm) per year. They have a growing season and a dormant season. In the dormant season, the grasses do not grow.



The temperature is too cold. When the temperature reaches 50°Fahrenheit (10°C) the grasses and other indigenous plants begin growing. Some animals that live in temperate grasslands, such as deer and bison, graze on the grass. Others, such as mice, jackrabbits, and prairie dogs, find shelter underground. Animals that live in temperate grasslands have adapted to survive in the wind and winter cold.

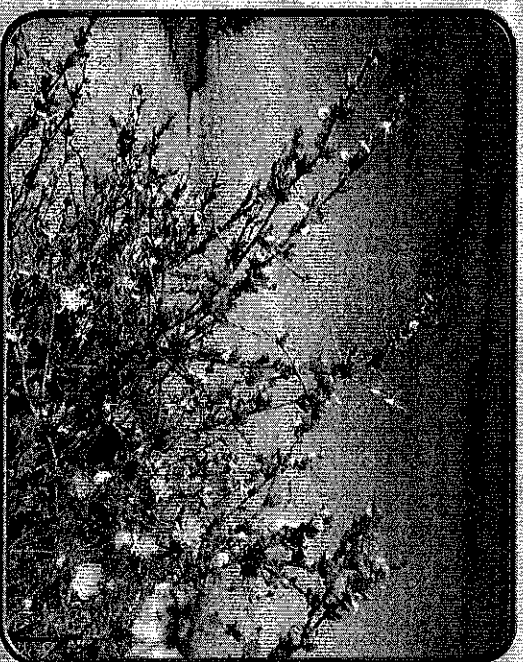
Some seasons bring unusually hot and dry weather. As a result, grasslands can become brown and dry. Fires can burn quickly through dry grasslands, but the grass isn't killed. Grasses grow from the bottom. So, if the stems at the tops of the grasses burn off, the roots can still produce growth. Fire is actually good for grasslands. Often fires are started naturally by lightning. Throughout history, people have set fires on purpose to burn off the grasses. Fire keeps unwanted trees and shrubs from taking over. It allows grasses to grow in the

places where trees would otherwise have grown.

Most grasslands can be found between forests and deserts. At one time, a quarter of the Earth's surface was covered with grasslands. Now many have been turned into farms. In fact, they provide us with 80% of our agriculturally productive land. The soil is rich and fertile. Grasslands are generally flat or slightly hilly and open. Thus they are ideal places for growing crops and grazing animals. On the other hand, the more that farms take over grasslands, the less space the wildlife has to live.

Poor farming practices can destroy the land by ruining the soil. Once-healthy grasslands can be turned into barren spaces.

As with other habitats, it is our responsibility to make sure that grasslands continue to thrive. People and animals alike depend on grasslands for survival.



DID YOU KNOW?

The African savanna is home to many well-known and amazing types of animals.



Directions: Box and Bullet the article "The Grasslands."

Name _____

Date _____

Directions: Write a summary of the article "The Grasslands" using your box and bullets.

Name _____ Date _____

Name _____ Date _____

Directions: Draw a picture of a plant or animal from the grasslands and explain why it can live in that habitat. Label your plant or animal with its name.

3rd Grade Science - Day 5-6

Standard:

3.L.5 The student will demonstrate an understanding of how the characteristics and changes in environments and habitats affect the diversity of organisms.

Performance Indicator:

3.L.5A.1 Analyze and interpret data about the characteristics of environments (including salt and fresh water, deserts, grasslands, forests, rain forests, and polar lands) to describe how the environment supports a variety of organisms.

I Can...

- ☒ I can identify forest and rainforest environments.
- ☒ I can analyze data about the characteristics of forest and rain forest environments.
- ☒ I can describe how forest and rainforest environments support a variety of organisms.

Essential Questions:

- ☐ What characteristics of forest and rainforest environments impact the organisms that live there?
- ☐ How can changes in forest and rainforest habitats be beneficial or harmful to the organisms that live there?

Engage:

Forest/Rain Forest Notes – these will give you an overview of what your child should know by the end of the lesson. Any information not in the articles will be here for you to go over with your child.

Read the book “Woods of Wonder” to learn about what forest environments are and where they are located in the world.

Take the quiz for “Woods of Wonder.” Use the text to help answer the questions.

Read the article “Rainforest Ecosystems” and answer the questions.

Life Science: Environments and Habitat Notes

Day 5-6

Forests Habitat

- Have many trees (with needles or with leaves), shrubs, grasses and ferns, and a variety of animals.
- They usually get more rain than grasslands.
- Temperatures in the forests may vary depending on where the forest is located.

Rainforests Habitat

- Are very humid and warm and have an abundance of rain that leads to lush plant growth (for example, tall trees, vines, ferns, orchids, and other colorful flowering plants).
- Animals that live in the rainforest are often very colorful, to match the varieties of plants (for camouflage)
- Many animals are also tree dwellers (i.e., birds and lizards), moving across the canopy rather than traveling on the ground.

Woods of Wonder

A Reading A-Z Level R Leveled Book

Word Count: 877



 **Reading A-Z**

Visit www.readinga-z.com
for thousands of books and materials.

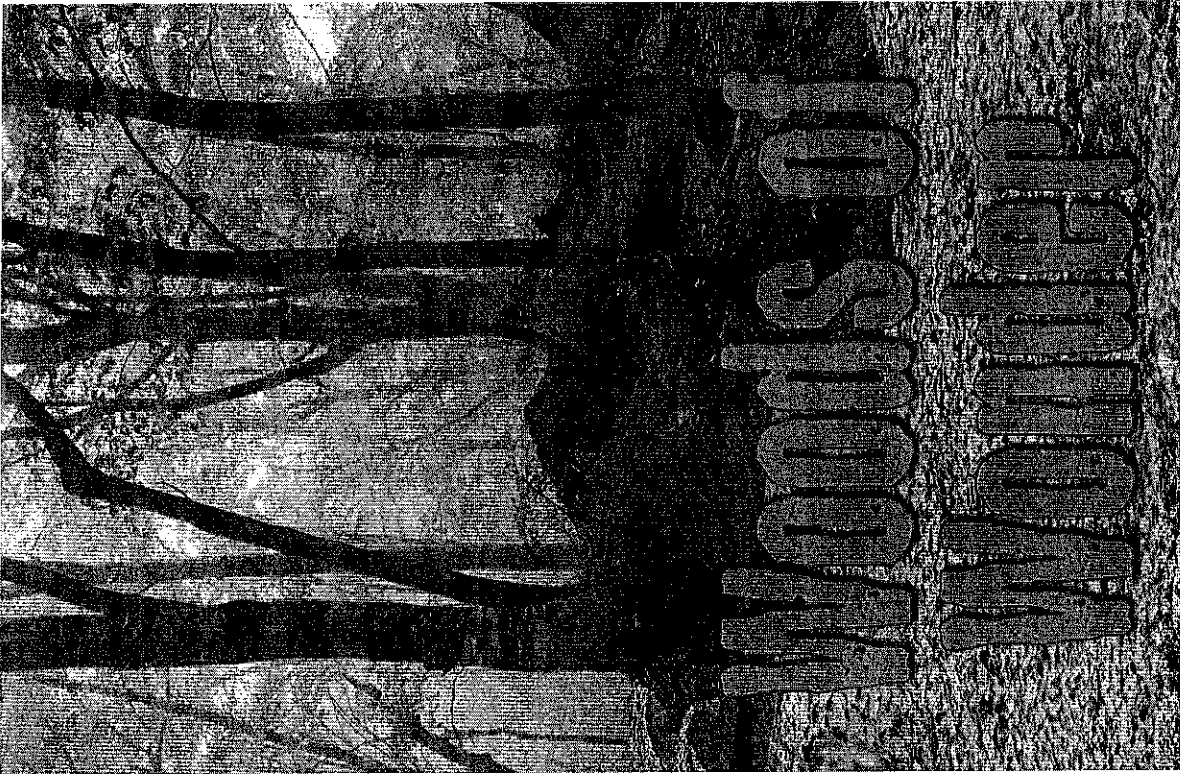
LEVELED BOOK • R

Woods of Wonder

**Multi
Level
L•O•R**

Written by Rus Buyok

www.readinga-z.com



Written by Rus Buyok

www.readinga-z.com

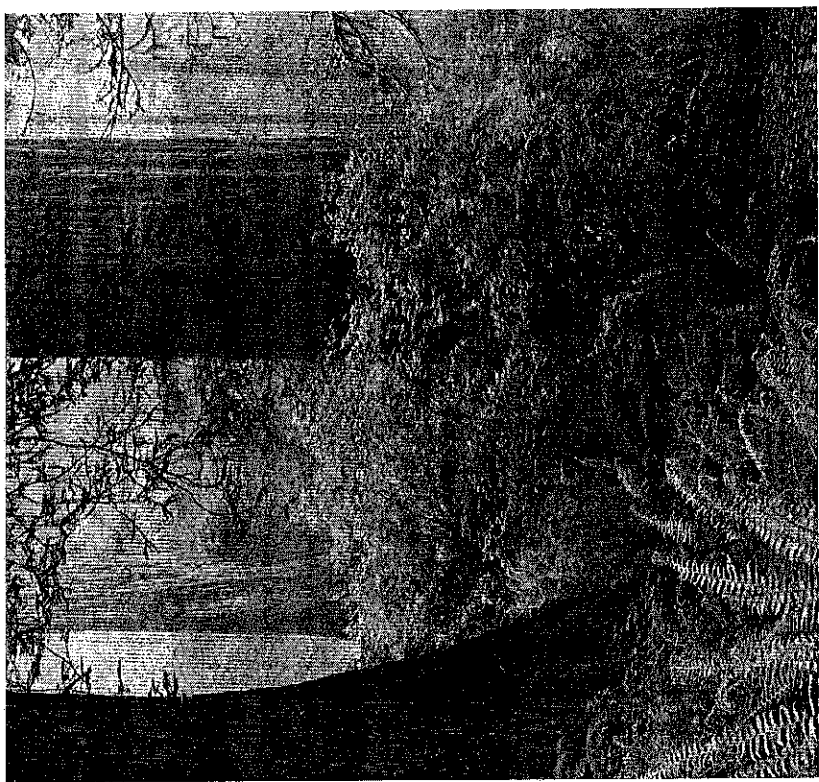
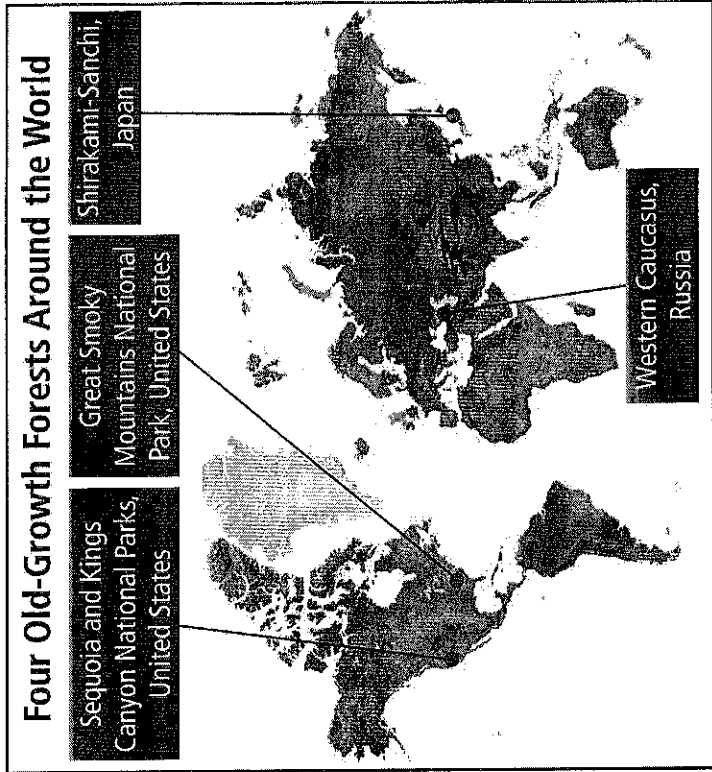
Photo Credits:

Front cover, page 8 (bottom right): © Gary Moon/age fotostock/SuperStock;
back cover: © Dennis Sabo/Alamy; title page: © MIXA/Alamy; Page 4: © William
Manning/123RF; page 7: © Mike Theiss/National Geographic Stock; page 8 (top):
© Robert Harding Picture Library/SuperStock; page 8 (bottom left): © fototato/
Blickwinkel/age fotostock; page 9: © Daniel Dempster Photography/Alamy; page 10
(top): © Stephen Dalton/Minden Pictures; page 10 (bottom): © Shatfil & Rozinski/
NPL/Minden Pictures; page 11: © Kazuma Anezaki/Nature Production/Minden
Pictures; page 12 (left): © Hitroya Mindkuchi/Minden Pictures; page 12 (right):
© Susumu Ishie/Nature Production/Minden Pictures; page 13: © Wild Wonders of
Europe/Schandy/Minden Pictures; page 14 (top): © Cyril Ruoso/JH Editorial/Minden
Pictures; page 14 (bottom): © Cultura RM/Alamy Stock Photo; page 15: © Danita
Delimont/Alamy

Woods of Wonder
Level R Leveled Book
© Learning A-Z
Written by Rus Buyok
All rights reserved.
www.readinga-z.com

Correlation

LEVEL R	
Fountas & Pinnell	N
Reading Recovery	30
DRA	30



Oh, That's Old! 4

United States 7

Japan 11

Russia 13

The Future of Old-Growth Forests 15

Glossary 16

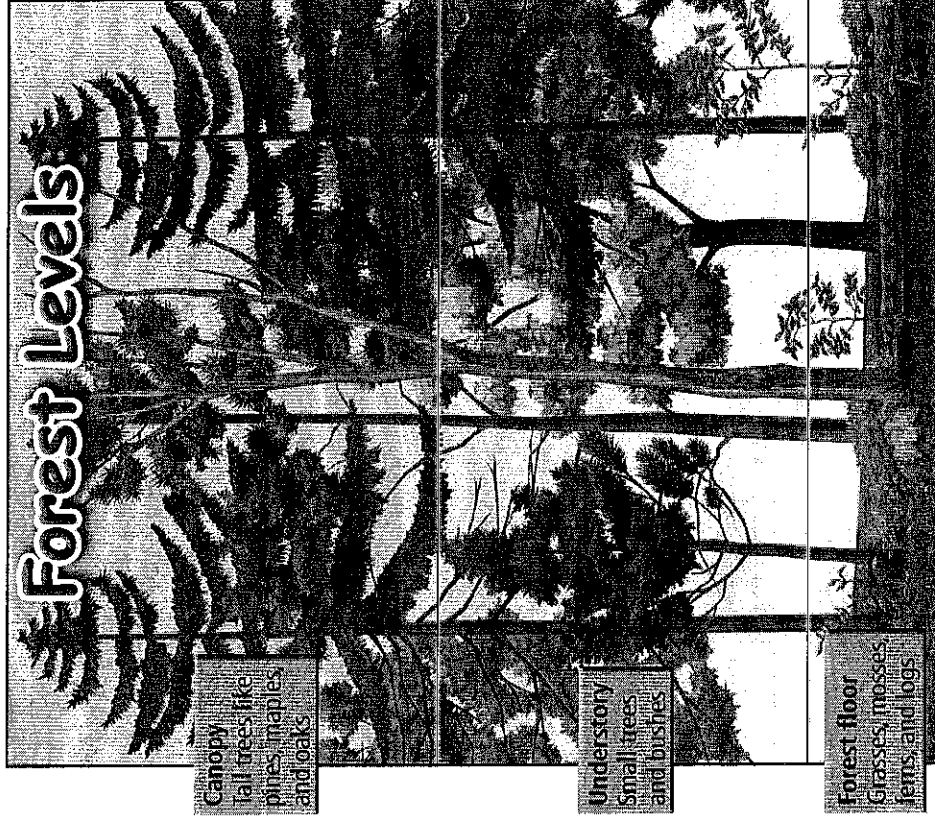
Oh, That's Old!

Imagine you're in a dark, lovely forest. Trees with trunks wider than cars tower overhead and block almost all the sunlight. Small ferns and other plants soak up what little light they can find. Pine needles and other dead leaves cover the ground. Like something out of a fairy tale, an **old-growth** forest is a place of wonder and mystery.

For some old-growth forests, this scene wouldn't be far from the truth. Others might look quite different. Some old-growth forests have only one type of tree, while others have many. Some may have trees that seem to touch the sky, while others have trees shorter than a house.

Because of this variety, scientists do not have one definition for old-growth forests. Still, they have found some features that many old-growth forests share.

Many scientists agree that an old-growth forest must be at least 150 years old. The age of each tree in the forest may vary widely, however. The forest's structure must also be complex. This means that the **canopy** must have varying layers with large trees, both living and dead (or dying). Fallen trees create holes in the canopy where young trees can find the sunlight to grow. Fallen trees and upright dead trees, called *snags*, provide food and shelter for many animals, plants, and fungi. Some of these **species** live nowhere else on Earth.



Old-growth forests are some of the most beautiful and scientifically interesting places on Earth. Yet because of humans, many of them have shrunk or disappeared. By carefully studying and protecting the ones that remain, we can understand the complex and delicate **ecosystems** they create.

United States

Sequoia and Kings Canyon National Parks in California together cover more than 1,353 square miles (3,504 sq km). They hold more than 300 square miles (777 sq km) of old-growth forest.



The General Sherman Tree is the largest tree on the planet (but not the tallest).

known as the General Sherman Tree is the largest tree in the world.

This forest includes a variety of tree species, mostly **coniferous** but **deciduous** as well. One of the most amazing of these is the giant sequoia. Found only in California, these huge trees are among the oldest on Earth. They can live for more than 3,000 years.

A giant sequoia

Thousands of creatures live in the park, including the Pacific fisher. This relative of the weasel lives under the thick canopy in old-growth forests. It hunts birds and small mammals—but its favorite meal is porcupine. Because its habitat is limited to old-growth forests, it is now rare in California, Oregon, and Washington.



Fisher



Sequoia



Redwood

Sequoia vs. Redwood

Giant redwoods and giant sequoias both grow in California. They have the same color bark. Both are huge, but they're different.

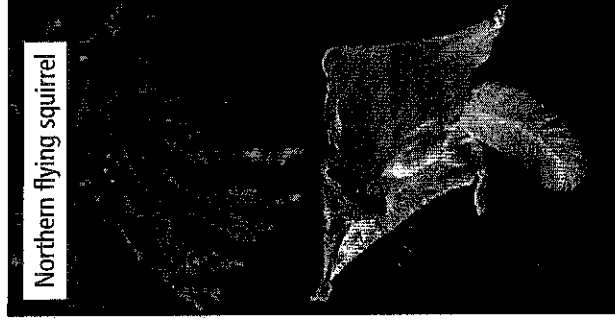
Giant redwoods are the tallest trees in the world. They can reach up to 378 feet (115 m)! Giant sequoias are the largest. At up to 40 feet (12 m) in diameter, they can grow almost twice as wide as redwoods.

Redwoods grow best in fog. Sequoias need dry heat for their cones to open. Redwoods grow near sea level. Sequoias grow at 5,000 to 7,000 feet (1,524 to 2,134 m).



Autumn is colorful in Great Smoky Mountains National Park.

Across the United States in the Appalachian Mountains of North Carolina and Tennessee, Great Smoky Mountains National Park covers more than 800 square miles (2,072 sq km). Almost all of the park is forest, with old-growth forests only making up about 25 percent. Deciduous trees make up most of the old-growth forests in this area. Species include dogwood, Carolina silverbell, magnolia, American beech, yellow bird, and maple, among others.



Northern flying squirrel

The endangered Carolina northern flying squirrel makes its home among these trees. These small mammals don't actually fly. They use skin attached at their front and back paws to glide. They mostly eat fungi and lichens but may also feed on fruits and nuts. Without the old-growth forest, these animals would vanish.



Tough, Not Tall

Not all old-growth forests feature towering trees. In some harsh places exposed to fierce and frigid winds, pines, spruces, and other coniferous trees become stunted and twisted. These trees are called *Krummholz*, a German word meaning "crooked wood." They live near the Arctic and near timberline, the boundary on a mountain where the trees stop growing. They never grow much over 6 feet (1.8 m) tall, but don't let their size fool you. Some are one thousand years old.



A Seibold's beech tree reaches for the sun in Shirakami-Sanchi, Japan.

Japan

In the northern part of Japan sits Shirakami-Sanchi. It's one of the last untouched old-growth forests in East Asia. Made up mostly of Seibold's beech trees, the area covers just 65 square miles (170 sq km) of the Shirakami Mountains. Forests like this one once covered most of northern Japan, but many have been cut down.

Almost completely untouched by humans, Shirakami-Sanchi has no trails or structures. Because of its steep slopes, no trees have been cut down. Wildlife within the area is protected, although hunters called *Matagi* are sometimes allowed to hunt bears as part of their religion.

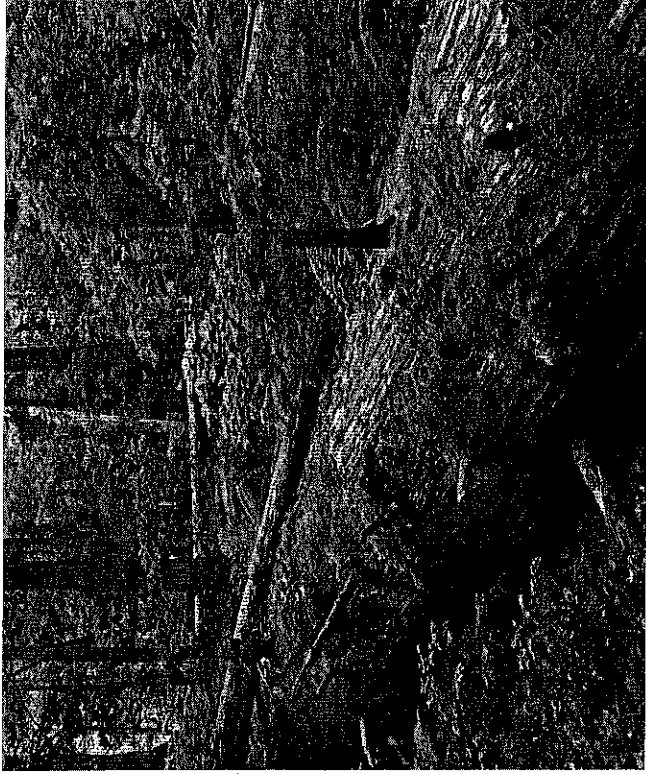
The forest is also home to the Japanese serow. This goatlike animal is only found here and in two other small areas in Japan. More than 2,100 insect species and 87 bird species live in the forests—including the black woodpecker, an endangered species in Japan.



Japanese serow



Black woodpeckers



Fallen trees like this fir can nurse along other plants in this old-growth forest in the Caucasus region of Russia.

Russia

Russia's Western Caucasus region stretches about 1,062 square miles (2,750 sq km) from the Black Sea to the Caucasus Mountains. Protected within Caucasus State Biosphere Reserve and Sochi National Park, this area shows great **diversity**. Coniferous trees make up most of the forests. Different species, such as pine, cedar, fir, and spruce—as well as beech and oak (both deciduous)—grow in different areas and at different elevations.



A variety of endangered animals make their home in these forests. Some scientists think that a very small number of endangered snow leopards survive there. No sightings have been reported for years, but scientists still find signs of the large cats, such as paw prints and scat. The endangered wisent, or European bison, has also been returned to the forest. The last wild wisent was killed in the Western Caucasus in 1927. People set captive wisents free in the area in 1940.



The Future of Old-Growth Forests

Old-growth forests often contain very complex ecosystems that have been supporting life for hundreds or even thousands of years. Governments, national parks, and organizations protect many of these places. However, other old-growth forests, both small and large, are in danger. Human actions can damage or destroy these delicate ecosystems.

Once gone, the beauty and scientific information that these old-growth forests hold may be lost forever.

Laws prevent logging in some old-growth forests but not others. People continue to debate how much protection is enough.



Glossary

canopy (<i>n.</i>)	the part of a forest where the tops of trees form a dense layer of foliage (p. 5)
coniferous (<i>adj.</i>)	referring to a large group of plants, mostly trees, that grow cones and have leaves shaped like needles or scales (p. 7)
deciduous (<i>adj.</i>)	having leaves that drop off in the fall and grow back in the spring (p. 7)
diversity (<i>n.</i>)	a wide variety of many things (p. 13)
ecosystems (<i>n.</i>)	communities of living things together with their habitat (p. 6)
endangered (<i>adj.</i>)	in danger of dying out completely (p. 10)
old-growth (<i>adj.</i>)	of or relating to very old forests (p. 4)
reserve (<i>n.</i>)	a place where wild plants and animals are protected (p. 13)
species (<i>n.</i>)	a group of living things that are physically similar and can reproduce (p. 5)

Name _____ Date _____

Instructions: Read each question carefully and choose the best answer.

1. According to the book, where are old-growth forests found in the world?
 - Ⓐ the United States
 - Ⓑ Japan
 - Ⓒ Russia
 - Ⓓ all of the above
2. In what way are all the forests in this book alike?
 - Ⓐ They all have sequoia trees.
 - Ⓑ They all are at least 150 years old.
 - Ⓒ They all are mostly made up of deciduous trees.
 - Ⓓ They all have snow leopards.
3. Which of the following is an opinion?
 - Ⓐ People should not be allowed in old-growth forests.
 - Ⓑ Sequoias are the largest trees in the world.
 - Ⓒ No one has seen a snow leopard for years in Russia.
 - Ⓓ Deciduous trees lose their leaves every fall.
4. According to the author, what will happen if old-growth forests disappear?
 - Ⓐ New towns and roads can be built.
 - Ⓑ New plants will grow.
 - Ⓒ The animals that live there will vanish.
 - Ⓓ People will not know how old the trees were.
5. The Caucasus region in Russia is home to _____.
 - Ⓐ snow leopards
 - Ⓑ wisents
 - Ⓒ coniferous trees
 - Ⓓ all of the above
6. What is the main reason the author wrote this book?
 - Ⓐ to entertain
 - Ⓑ to inform
 - Ⓒ to persuade
 - Ⓓ all of the above

Quick Check continued on following page

Name _____ Date _____

7. Which of the following is a detail about the old-growth forest in Japan?
 - Ⓐ The forest is home to a rare kind of serow.
 - Ⓑ The forest is home to the endangered flying squirrel.
 - Ⓒ The forest is home to the wisent.
 - Ⓓ The forest has no animal life.
8. The _____ is a layer of the forest where the tops of trees form a dense layer.
 - Ⓐ ecosystem
 - Ⓑ canopy
 - Ⓒ reserve
 - Ⓓ sequoia
9. The author probably wanted to _____.
 - Ⓐ let readers know about the General Sherman tree
 - Ⓑ entertain readers with a story about how old trees can be
 - Ⓒ inform readers about unique old-growth forests
 - Ⓓ persuade readers to visit Sequoia National Park
10. Trees that have leaves that drop off in the fall and grow back in the spring are _____.
 - Ⓐ deciduous
 - Ⓑ coniferous
 - Ⓒ evergreen
 - Ⓓ old
11. **Extended Response:** Why should people protect old-growth forests? Cite evidence from the book to support your answer.
12. **Extended Response:** Why does the author state that an old-growth forest is a place of wonder and mystery?

Rainforest Ecosystems

Cross-Curricular Focus; Life Sciences

Rainforest ecosystems are found near the equator, the center imaginary line of latitude that runs east and west around Earth. Tropical rainforests have more rain than other areas. The weather is warm and humid all year long. There is lots of sunlight.

Living things are **abundant** in the rainforests. There are thousands of species of animals and even more kinds of plants. Their needs for sun, water and warmth are all met by the conditions of the rainforest. The excellent conditions allow them to **thrive**. There is an amazing amount and variety of plants in that one location. This variety makes the rainforests a major source of Earth's overall oxygen supply.

Tropical rainforests have layers of life. The uppermost layer is called the **canopy**. Very mature, tall trees stretch out their branches and leaves, nearly blocking out the sun in some places. Many animals live high in this green, leafy habitat. You can find monkeys, tree frogs and many different species of birds.

Below the treetops is a second layer, called the understory. The understory is shaded by the canopy. Not as much sunlight reaches the plants in the understory. Bushes and growing trees make up the understory. It is home to birds, reptiles and small climbing animals.

The third layer, the forest floor, is busy with life. Vines, shrubs, mosses, ferns, flowers and large predator animals, such as jaguars, can be found there. Small animals burrow into the ground and live in bushes. Leaf-cutter ants and other insects busily hunt for food and water.

Rainforests contain some of Earth's greatest biological treasures. Many medicines are made from plants found there. Scientists have used them to make some promising drugs for treating cancer and AIDS. Food sources are very rich, too. There are over 3,000 fruits alone. Rainforests also grow the vegetables and grains that make up most of the world's daily diet. You can find corn, potatoes, rice and squash there. Spices like ginger, cinnamon, and chocolate grow alongside coffee and a variety of nuts. The rainforests produce all this in addition to providing oxygen for Earth. The rainforests are very valuable to the planet.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) What is the canopy of the rainforest?

2) Why might a scientist be interested in the rainforests?

3) Do you think you could survive alone in a rainforest? Why, or why not?

4) Describe the conditions that make a rainforest a good place for many living things.

5) Rainforests are found near what imaginary line?