

# Learn-Along-Guide

## Forests

The Children's Hour radio show podcast

<https://www.childrenshour.org/forests/>



We hope you enjoyed listening to our interview with Lisa Markovchick, PhD, a conservation advocate and ecologist with [WildEarth Guardians](#).

This print-ready guide may help you learn more about Forests. Also, there are links to online resources where you can learn even more. Connections to core learning standards are shown on page 12.



***How are forests important in your life?***

***How are forests important to the environment?***

***Do you think it is possible to preserve our existing forests?***

***Which forests have you visited? What did you notice about the trees and other living things there?***

***What story does this photo tell?***

# What do you know?

## Get set to listen.

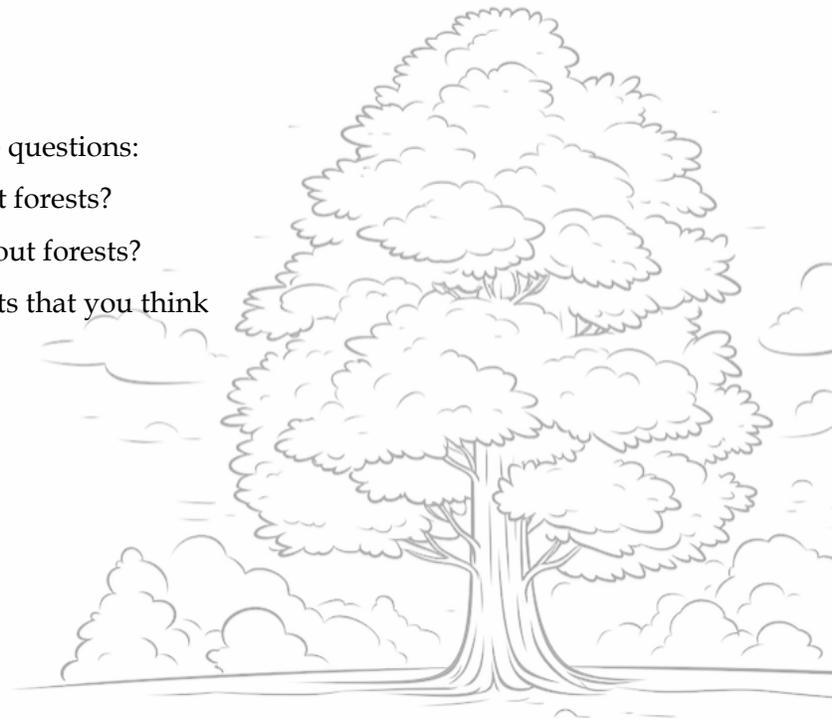
Read the statements below. In the “Before Listening” column, write “TRUE” if you think the statement is true. Write “FALSE” if you think the statement is not true. Then listen to the **Forests** episode of The Children’s Hour. Based on what the expert says, check if each point is true or false in the “After Listening” column. If the statement is false, explain why it is false.

Before Listening	TRUE or FALSE?	After Listening
	1. Forests support species of living things that cannot survive anywhere else.	
	2. Trees don’t have eyes but can sense light.	
	3. Trees don’t have ears but can sense vibrations.	
	4. Trees don’t have mouths but can communicate by humming.	
	5. Fungi can live inside the leaves of a tree.	
	6. About 50% of old growth forests remain in the world.	

## What did you learn?

After listening to the radio show, answer these questions:

1. What is one new fact you learned about forests?
2. What is one new question you have about forests?
3. What is an important thing about forests that you think everyone should know?



These are the jokes, folks!



**What did the tree wear to the pool party?  
Swim trunks!**

Did you laugh at Thorfin's joke? He had a good delivery. Below are a few more forest jokes. Practice your delivery by telling them to your family and friends.

**What's a tree's favorite radio station?  
One that plays poplar songs.**

**What kind of stories do giant sequoia trees tell?  
Tall tales.**

**What type of tree likes to give high fives?  
A palm tree.**

**How can you identify a dogwood tree?  
By its bark.**

**Why did the pine tree get in trouble?  
It was being knotty.**

**Where do cottonwood trees keep their valuables?  
In a riverbank.**

**How do trees send emergency messages in the forest?  
They use moss code.**

**What did the tree say to the bully?  
Leaf me alone.**

**Why did all the forest's worker bees go on strike?  
They wanted shorter flowers and more honey.**

**Did you know that I can cut down a tree just by looking at it?  
Yep. I saw it with my own eyes!**

**I'm the part of a tree that is not in the sky or under the ground. I can move throughout the day and change shape. What am I?  
I am the tree's shadow.**

**What falls all over the forest but never gets hurt?  
Rain.**

**Where do you find forests without trees, roads without cars, and towns without houses?  
On a map.**

**Why don't you ever see hippos hiding in the trees?  
Because they're really good at it.**

**How many trees can you plant in an empty forest?  
One. After that, it's not empty anymore.**

**What does Obi-Wan Kenobi say after he plants a tree?  
May the forest be with you.**

**Why do trees dislike riddles?  
Because they don't like getting stumped.**

# Mature and Old Growth Forests



**Old growth** is the latest stage of forest development. These forests have developed over a very long time, and they remain unharmed by humans. An old growth forest has large trees (the tallest with the broadest **canopy**), many standing or fallen trees, a thick organic layer on the forest floor, and mineral-rich soils. Due to their age and complexity, old growth forests can support an amazing diversity of living things, including **mycorrhizal fungi** that live

underneath the forest floor. (See page 7.) These forests also may be called primary forests, virgin forests, or ancient woodlands, depending where in the world you live.

**Mature** forests are the stage just before old growth. In general, mature forests contain more complexity in size and tree arrangement than younger forests but lack larger tree sizes and the complex tree arrangement found in old growth. It takes about 80 years for a forest to reach mature status.

Get more forest facts (with printable infographic) online: <https://onetreepanted.org/blogs/stories/forest-facts-kids>



The Tongass National Forest in Alaska is the largest **old growth forest** in the United States and the largest old growth **coastal temperate rainforest** in the world. This 9.7-million-acre forest is home to 400 animal species, including all five species of Pacific salmon, migratory songbirds, and grizzly bears.

View *photos* of old growth forests in the US: <https://www.americanforests.org/article/discover-5-of-americas-old-growth-forests/>

These *maps* show mature and old growth forests in the US by region: <https://wildearthguardians.org/public-lands/mature-old-growth-forest-maps/>

Read more about old growth forests all over the world: <https://www.smithsonianmag.com/travel/amazing-old-growth-forests-world-180956083/>

# Why are forests valuable?

Mature and old growth forests play an essential role in the health of health of our planet. They are valuable because:

1. Forests sequester and store massive amounts of **carbon** from the atmosphere. (See page 6.)
2. Forests provide unique habitats and **microclimates** for many species of plants, fungi, and wildlife. They are a source of biodiversity.
3. Forests are natural water treatment systems. They absorb pollution and produce clean drinking water.
4. Forest cover can attract rainfall (also known as a **biotic pump**).
5. Forests reduce the risk of flooding, erosion, and landslides.
6. Forests have been home for Indigenous peoples since the beginning of human existence. They are the source of nutrition, medicine, and culture for these communities.
7. Some **medicines** come from plants and fungi of the forest; and many more medicines are yet to be discovered there.
8. Forests offer a variety of recreational activities for humans, including camping and hiking.

*Can you draw a picture that represents one or more of the values listed above?*



# How do forests trap carbon?

Forests are a major part of the **carbon cycle** on Earth. The element carbon cycles through the atmosphere, everything on land, and underneath the surface. Trees take in, or **sequester**, carbon from the atmosphere in the form of **carbon dioxide** to make food for themselves. Trees **store** the carbon in their trunks, roots, branches, and leaves. About half of the total weight of a tree is carbon. Trees in an old growth forest store carbon for very long periods of time. Much of the carbon stays in the forest, including in the soil, even after trees die and naturally decay, but a significant amount can get **released** back into the atmosphere through logging. Also, carbon dioxide is released into the atmosphere when fossil fuels are extracted from the ground and burned. Forests can absorb those carbon emissions, if left standing, and the cycle continues.



Video: How do trees clean the air and store carbon? <https://youtu.be/HJ9yzkwX5N8>



Video: What is deforestation? <https://youtu.be/vJnnrpSDWPI>

**Deforestation** is the clearing, or cutting down, of forests. The word is normally used to describe the actions of humans, rather than the natural disturbance of forests caused by wildfires or hurricanes.

When an area is deforested, many plants and animals are killed. Others lose their habitats. Fungal networks are disrupted. Some types of living things go extinct or are forced to move away. Furthermore, the traditional way of life for Indigenous peoples can be greatly affected by deforestation.

A single tree can absorb up to 48 pounds of carbon dioxide from the atmosphere each year, which makes the forests important in combatting climate change.

Despite this, forests are being systematically eliminated across the world. Why?

- **Agriculture** (food production) for palm oil, soy, and cattle
- **Logging** for lumber, fuel, and paper
- **Urban development**

Since prehistoric times, the Earth has lost one-third of its forests, and now we are losing more than 15 billion trees every year due to deforestation. If humans would stop clearing forests, and instead use mindful, innovative approaches to energy, land use, and agriculture, climate change could come to a halt. Right now, keeping mature and old growth forests intact is the best way to keep carbon out of the atmosphere.

Beyond that, **reforestation** (planting trees) is helpful to counterbalance the deforestation that has occurred historically. Planting native trees can restore our damaged landscapes and, over time, bring back healthy forests.

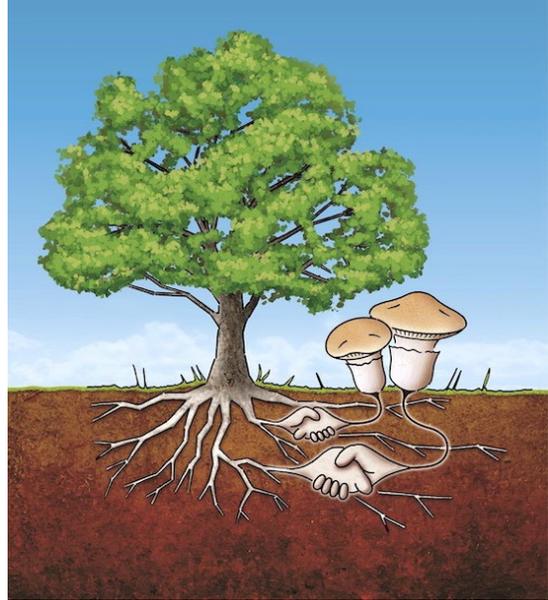
Read more about deforestation across the world:  
<https://www.nationalgeographic.com/environment/article/deforestation>

# Mycorrhizae

**Mycorrhizal fungi** form a  **symbiotic**, mutually beneficial relationship with plants. They help plants take up water and nutrients and, in turn, these fungi get access to the sugars the plants make through photosynthesis.

**Mycorrhizae** (a term derived from the Greek words for *fungus* and *root*) are a fascinating group of fungi. They form a web of fine, tubular filaments called **hyphae** that reach far into the surrounding soil — much farther than a plant’s roots. The hyphae act like extensions of the roots, greatly increasing the surface area available for the absorption of nutrients and water. The hyphae filaments form an extensive yet delicate, lace-like web throughout the soil. This network is called the **mycelium**.

About 95% of the plants that scientists have examined exhibit some form relationship with mycorrhizal fungi. All the trees of a forest may be connected through an underground fungal network.



Read more about mycorrhizae: <https://untamedscience.com/biology/ecology/mycorrhizae/>

**Mycorrhizal fungi** serve the ecosystem in many ways. Evidence shows that they:

- A. Hold together the soil, preventing erosion.
- B. Collect and transport nutrients and water for plants.
- C. Provide food for mammals and insects.
- D. Send warning signals that may help trees protect themselves against pests.
- E. Increase the storage of carbon belowground.
- F. Increase plant diversity, growth, and resilience aboveground.
- G. Reduce the temperature of the forest which helps more plants to grow.



Video: See how trees form **symbiotic** relationships with mycorrhizal fungi.

[https://youtu.be/7kHZ0a\\_6TxY](https://youtu.be/7kHZ0a_6TxY)

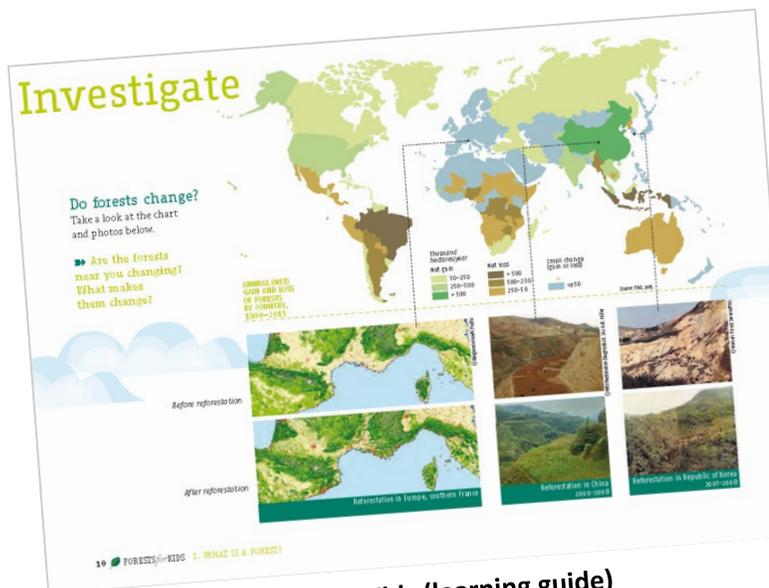
For more about fungi, listen to The Children’s Hour episode **Fungus Among Us**: <https://www.childrenshour.org/fungus-among-us/>



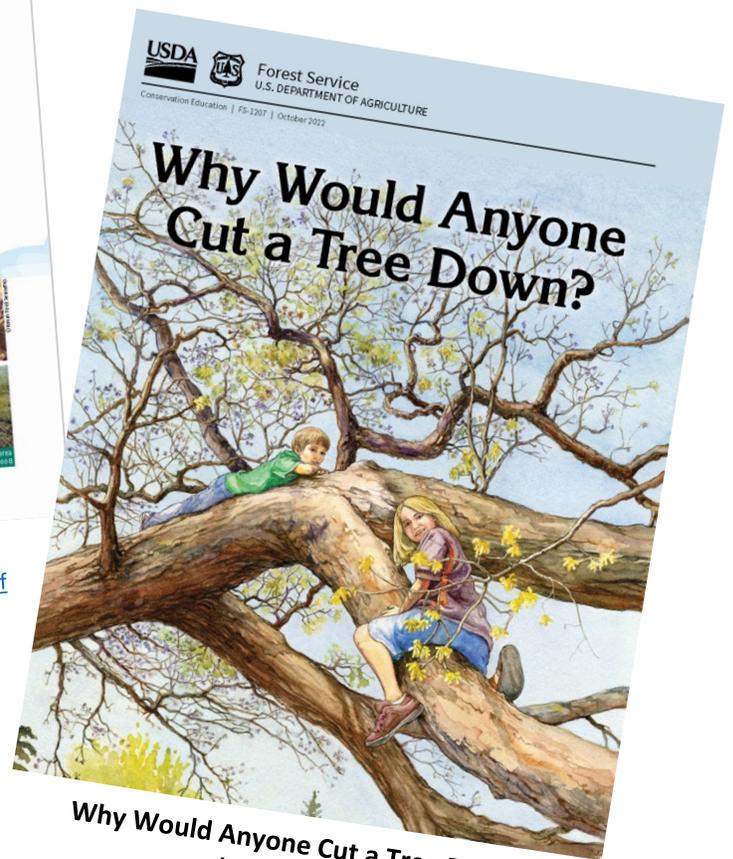
# How can we help the forests?

Here are some ways kids can get involved in knowing, protecting, and restoring forests:

1. Find a forest near you: <https://discovertheforest.org/>
2. Do tree and forest activities: <https://www.nationalforests.org/blog/forest-tree-activities-to-do-with-children>
3. Learn how to identify native plants and native fungi by joining a society in your region: <https://ahsgardening.org/gardening-resources/societies-clubs-organizations/native-plant-societies/>; and <https://namyco.org/clubs.php>
4. Prevent forest fires: <https://smokeybear.com/>
5. Become a US Junior Forest Ranger: [https://www.fs.usda.gov/detail/conservationeducation/materials/national-curriculum/?cid=fsmrs\\_100606](https://www.fs.usda.gov/detail/conservationeducation/materials/national-curriculum/?cid=fsmrs_100606)
6. Practice forest stewardship: <https://extension.psu.edu/forest-stewardship-teaching-youth-about-forest-stewardship>
7. Write a letter to your elected officials: <http://kidgovernor.org/student-action-resource-center/writing-to-your-elected-officials>
8. Get these PDF books:



**Forests for Kids (learning guide)**  
[https://catalogue.unccd.int/1179\\_Forest\\_for\\_kids\\_learning.pdf](https://catalogue.unccd.int/1179_Forest_for_kids_learning.pdf)



**Why Would Anyone Cut a Tree Down?  
(a storybook)**  
[https://www.fs.usda.gov/sites/default/files/fs\\_media/fs\\_document/Why-Would-Anyone-Cut-A-Tree-Down.pdf](https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/Why-Would-Anyone-Cut-A-Tree-Down.pdf)

# What is forest bathing?

In 1982, the Japanese Ministry of Agriculture, Forestry, and Fisheries created the term *shinrin-yoku*, which translates to “forest bathing” or “absorbing the forest atmosphere.” The practice encourages people to simply spend time in nature. (No actual bathing in water is required.) You don’t have to go for a run or a hike. During **forest bathing** you live in the present moment while immersing your senses in the sights and sounds of a natural setting.

Forest bathing has been found to lower blood pressure, heart rate, and levels of harmful hormones like **cortisol**, which your body produces when it’s stressed. This can help put you in a more calm and relaxed state.

How do you bathe in a forest? Just get yourself under some trees. A heavily wooded area isn’t required. You could take a trip to a nearby park, a local trail, or any natural setting. Just be sure to deactivate your phone or other devices. The key is to practice **mindfulness**. That means being present and fully in the moment.

Take a few deep breaths. Focus on what your senses are taking in — whether it’s the scent of clean air or the sounds of chirping birds. Sit and watch how the trees sway in the wind, or simply walk around. If you decide to walk, go at an easy pace and without a specific destination in mind. It’s important to let your mind and senses explore and enjoy the environment.

Ease. Dwell. Wonder.

*Safety tips:* Always pay attention to your surroundings, stay on marked trails, and wear appropriate gear. Remember to consider things like sun protection and allergies. Bring another person with you, or let an adult know where you’re going and for how long.

Even if it’s only for ten minutes, it can have an impact. The goal of forest bathing is to relax and break away from the stresses of the day.

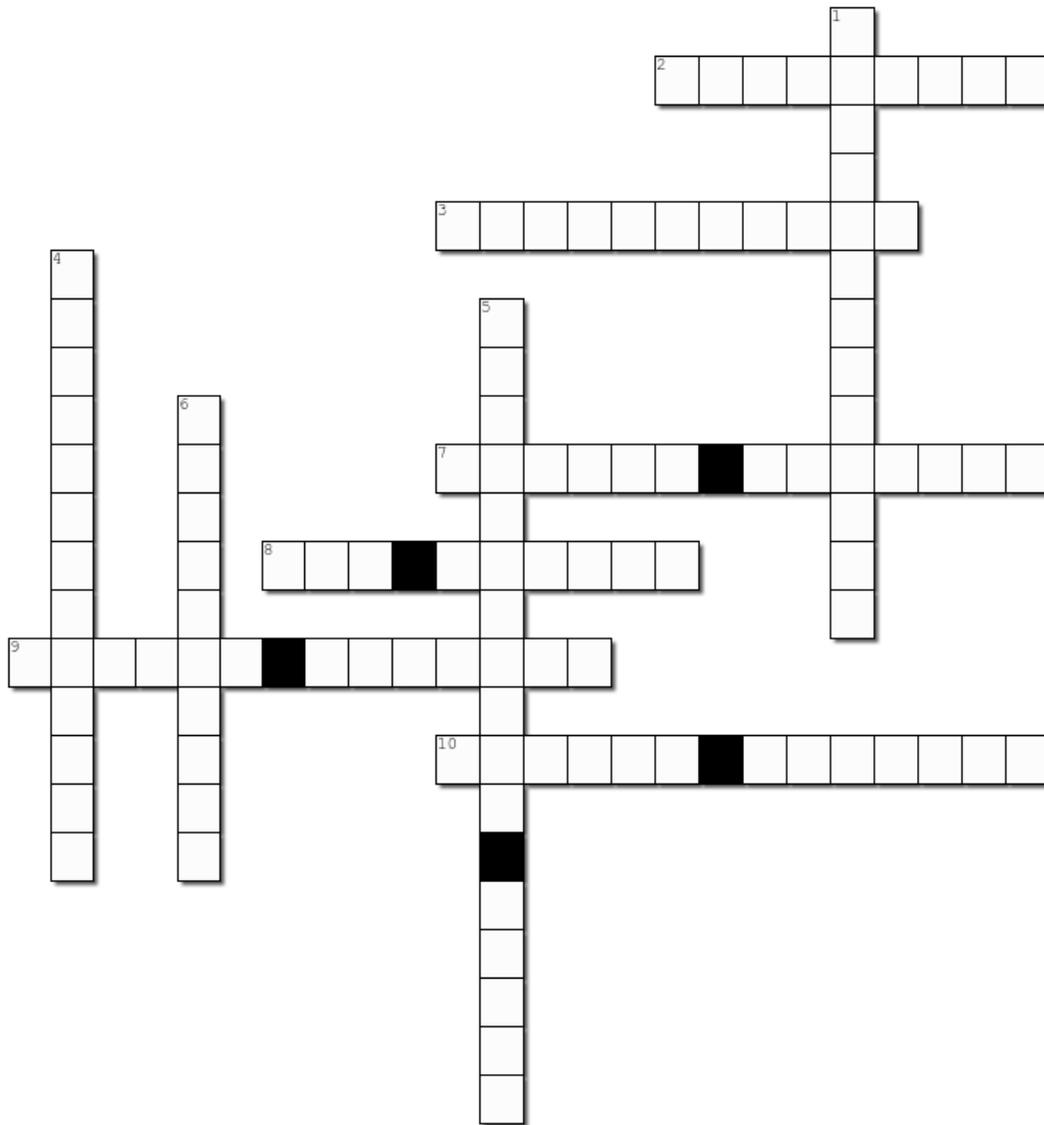
So... go to the trees! Find some joy there.



Free Stock photos by Vecteezy <https://www.vecteezy.com/free-photos>

## Crossword Puzzle: Forests

Hint: Words used in this puzzle appear in **boldface** in this learning guide.



Created using the Crossword Maker on TheTeachersCorner.net

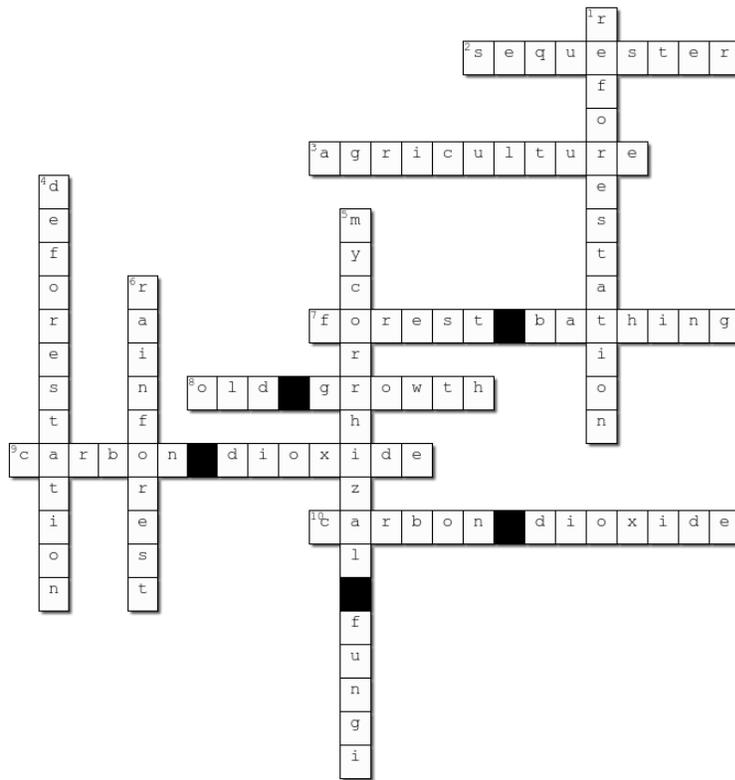
### **Across**

2. to collect and hold on to something
3. A practice that caused many forests to be cut down
7. During \_\_\_\_\_ you live in the present moment while immersing your senses in the sights and sounds of a forest
8. An \_\_\_\_\_ forest has grown over many decades, has many big trees, and an amazing diversity of living things.
9. Trees take in \_\_\_\_\_ from the atmosphere.
10. Burning fossil fuels releases \_\_\_\_\_ into the atmosphere.

### **Down**

1. intentionally planting trees in an area
4. Stopping \_\_\_\_\_ can help stop climate change.
5. \_\_\_\_\_ help plants obtain nutrients and send signals to each other.
6. The Tongass National Forest in Alaska is the largest old growth coastal temperate \_\_\_\_\_.

## Crossword: Answer Key



Created using the Crossword Maker on TheTeachersCorner.net

### Across

2. to collect and hold on to something (**sequester**)
3. A practice that caused many forests to be cut down (**agriculture**)
7. During \_\_\_\_\_ you live in the present moment while immersing your senses in the sights and sounds of a forest (**forest bathing**)
8. An \_\_\_\_\_ forest has grown over many decades, has many big trees, and an amazing diversity of living things. (**old growth**)
9. Trees take in \_\_\_\_\_ from the atmosphere. (**carbon dioxide**)
10. Burning fossil fuels releases \_\_\_\_\_ into the atmosphere. (**carbon dioxide**)

### Down

1. intentionally planting trees in an area (**reforestation**)
4. Stopping \_\_\_\_\_ can help stop climate change. (**deforestation**)
5. \_\_\_\_\_ help plants obtain nutrients and send signals to each other. (**mycorrhizal fungi**)
6. The Tongass National Forest in Alaska is the largest old growth coastal temperate \_\_\_\_\_. (**rainforest**)

## Get Set to Listen: Answer Key

4. Trees don't have mouths but can communicate by humming. = FALSE [...communicate using chemical signals.]

5. Fungi can live inside the leaves of a tree. = FALSE [...live inside the roots of a tree, called mycorrhizae.]

6. About 50% of old growth forests remain. = FALSE [...only about less than 20% of old growth forests remain.]

All other statements are true.

## Connect to Curriculum

<http://www.corestandards.org>

<https://www.positiveaction.net/blog/sel-competencies>

<https://artinaction.org/standards/>

<https://www.learningforjustice.org/frameworks/social-justice-standards>

<https://www.nextgenscience.org/>

<https://www.socialstudies.org/system/files/2022/c3-framework-for-social-studies-rev0617.2.pdf>

Information/Activity	Core Idea	Learning Standards
<b>p.1 Focus Questions</b>	Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.	Common Core ELA: SL 1 (4,5)
<b>p.2 Get set to listen; What did you learn?</b>	Recount or describe key ideas or details from (a text read aloud or) information presented orally or through other media.	Common Core ELA: SL 2
<b>p.3 Telling jokes</b>	(Report on a topic or text,) tell a story, (or recount an experience) with appropriate facts and relevant, descriptive details...; speak clearly at an understandable pace.	Common Core ELA SL 4
<b>p.4, 5, 6, 7, 9</b>	<p>Read and comprehend informational texts, including history/social studies, science, and technical texts...</p> <p>Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.</p> <p>Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.</p> <p>Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.</p> <p>Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling.</p> <p>All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment.</p>	<p>Common Core ELA: RI 10</p> <p>NGSS: MS-LS2-1</p> <p>NGSS: MS-LS2-4</p> <p>NGSS: MS-LS2-5</p> <p>NGSS: MS-LS2-5</p> <p>NGSS: MS-ESS3-1, MS-ESS3-4</p>
<b>p.5 Coloring</b>	<p>Create art that represents natural and constructed environments.</p> <p>Describe what an image represents.</p>	<p>NCAS</p> <p>Creating #2 K</p> <p>Responding #7 K</p>
<b>p.10 Crossword Puzzle</b>	Use precise language and domain-specific vocabulary to inform about or explain the topic.	Common Core ELA: WHST 2 (6-8)

## About Us

The Children’s Hour Inc is a New Mexico-based non-profit organization that produces an award-winning children’s radio program that is educational, entertaining, and engaging, and includes kids who participate in its creation. The program is internationally syndicated broadcasting on more than 120 public radio stations worldwide. Program themes focus on civics, STEM, culture, and music education, featuring New Mexico children as co-hosts and lead interviewers. Katie Stone has been the executive producer of *The Children’s Hour* for more than two decades.



For more information, contact: Katie Stone | (505) 850-3751 | [katie@childrenshour.org](mailto:katie@childrenshour.org)

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## Tell us about you!

We at the Children’s Hour would like to know:

1. How old are you?
2. Was this your first time listening to a radio show or podcast for kids?
3. Was this radio show less fun or more fun compared to other things you do for fun, like playing video games or watching TV?  
 Less fun       More fun
4. Would you listen to a radio show again if you could?
5. Of everything you heard in the radio show, what will you remember most?

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If you would like to draw a picture about anything you learned on the radio show, we would like to see it. Scan and email it to us, and we may display it on our online space.

If you would like to tell the creators of this radio show something in your own voice, you can send a voice message to *The Children’s Hour* here:

<https://www.childrenshour.org/contact-us/>.

Look for the orange button and click to record.

