

Our Giant Sequoia Forests



Save The Redwoods
LEAGUE

The Biggest Trees in the World

Can you name the biggest and one of the oldest trees on the planet? The giant sequoia stand tall and large, trunks scarred by fire, branches covered in lichens, as they have lived for thousands of years. Giant sequoia trees are the biggest living trees on the planet. How many of your friends would need to hold hands to wrap around the largest giant sequoia?

Try This

Hold hands with your friends around a large tree in your neighborhood or local park. How many of you does it take to circle the tree?

The giant sequoia can grow to be more than 30 feet across – that's the length of a large orca.

Giant sequoia can also grow to be very old. They can live more than 3,000 years and continue to grow new wood every year. They grow so much wood, leaves and cones that they weigh more than any other tree in the world. The record holder is over 600 tons — the same as 60 school buses — and that is in a single tree!

Giant sequoia grow in small groves, or groups of trees, which are found in the Sierra Nevada mountains where snow falls during the winter months. When the snow melts in the summer, it gives the giant sequoia lots of water to grow large and strong.

Animal tracks in the snow

Many animals tell you they live in a forest by leaving footprints. Do you know who left the animal tracks on the bottom of the following pages?



Where to Visit the Giant Sequoia



Almost all of the giant sequoia groves are protected in state parks, national parks and national forests where you and your family can visit and enjoy them. When you visit a giant sequoia park, look up at the treetops and remind yourself you are standing among some of the oldest trees on Earth.

 **Giant Sequoia Range**



Sequoia Superhero Challenge

1. Which park is farthest north? Which park is farthest south?

2. Where do giant sequoia grow?

3. Which direction would you need to go to visit the giant sequoia?

4. How old can giant sequoia grow to be?



Giant Sequoia: Past to Present



MILLIONS OF YEARS AGO

Time of the Dinosaurs

Imagine a time 200 million years ago when the mighty sequoia trees were found throughout the northern continents. Dinosaurs roamed the planet during this time, likely walking among sequoia forests. **Over millions of years, ice ages and volcanic eruptions changed where the giant sequoia were able to grow and where they are found today.**

THOUSANDS OF YEARS AGO

Indigenous Tribes

Giant sequoia land is the ancestral home of many Indigenous tribes. They live among the massive trees, using forest plants for food, medicine, and basketry. Many Native people of this area see the giant sequoia as sacred relatives that should be treated with respect. Some believe the trees are protected by a spirit in the form of an owl. It is therefore bad luck to cut down a sequoia or harm an owl.

1850s

Europeans

When Europeans first discovered the giant sequoia, news spread quickly of these tall, massive trees. **Everyone wanted to see them and some wanted to use their wood to make money.** Trees were cut so they could be displayed in museums in Europe, and some were cut to make fence posts and roof shingles. The first giant sequoia was cut in 1856.



Sequoia Superhero Challenge



1. Compare how Indigenous tribes think of giant sequoia trees and how European settlers thought about using giant sequoia trees.

2. Why did people cut giant sequoia trees?

3. What did John Muir do to protect giant sequoia forests? Why do you think people wanted to protect giant sequoia forests?

1860s

The Fight to Protect

Many people loved the mighty sequoia trees and were sad to see them cut, so they worked hard to save them. John Muir and groups like Save the Redwoods League protected these trees by writing about their size and strength, sharing pictures of their beauty and buying land the trees grew on. In 1864, the first giant sequoia park was created, Mariposa Grove in Yosemite, permanently protecting the giant trees for public enjoyment.



TODAY

Sequoia and Fire

Although most of the giant sequoia are protected, they still need our help. As the original caretakers of the land, Native tribes intentionally burned the forests to prevent severe wildfires. We stopped fires from burning in these forests for many years because we thought it was bad. It turns out fire is good for giant sequoia. We can help make sure these trees stay healthy and strong by adding fire back to the forest. As our climate changes, it is important to protect these large trees because they help clean our air and give us a place to have fun.



Life Cycle of a Giant Sequoia

Cones

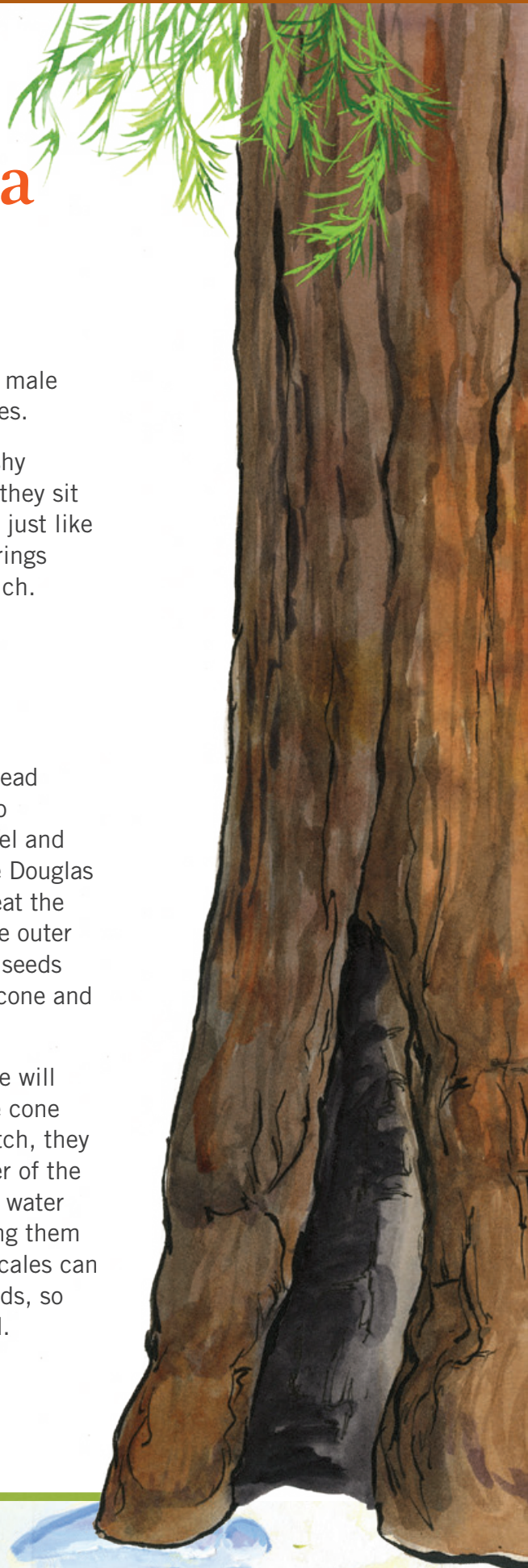
In mid-to-late winter, small male cones cover the branches of the tree. Wind blows pollen from the male cones through the forest and into the female cones.

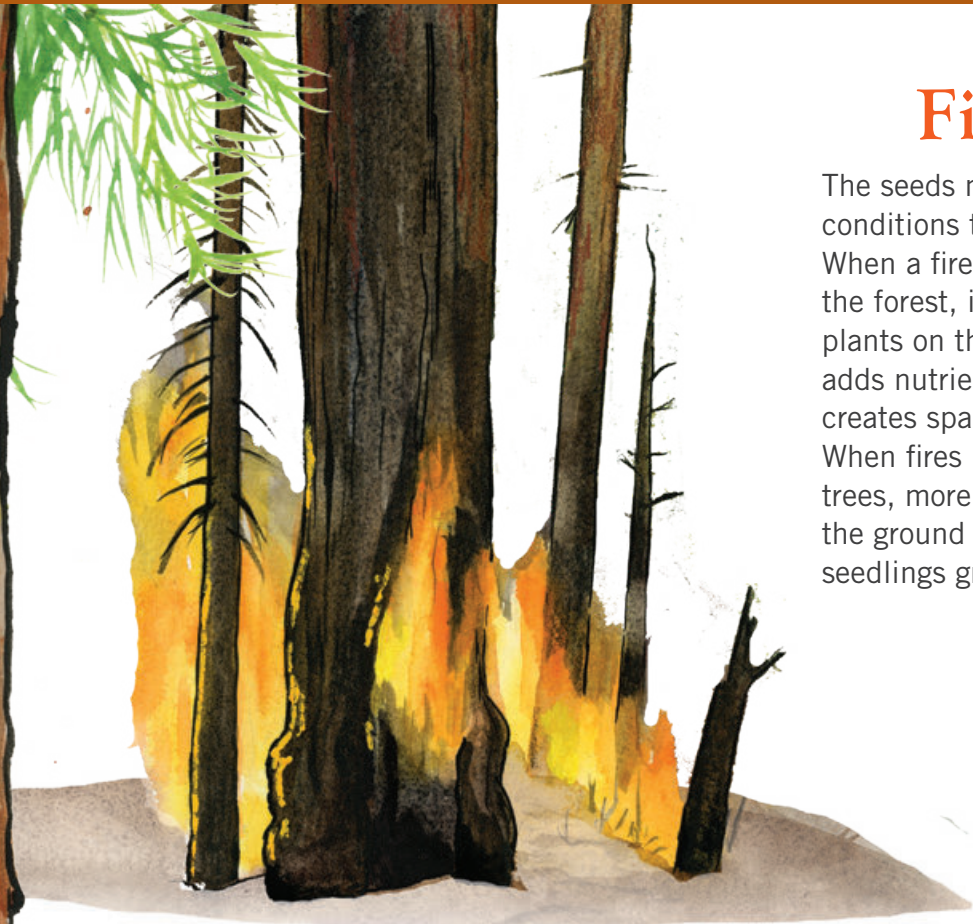
Female cones start off bright green with soft, fleshy scales. Lichens sometimes grow on the cones as they sit for years on a tree. You can tell the age of a cone just like you tell the age of a tree, by counting its growth rings found on the stem attaching the cone to the branch.

Seeds

Giant sequoia seeds are spread throughout the forest by two animals: the Douglas squirrel and the long-horned beetle. The Douglas squirrel, or chickaree, will eat the fleshy, green scales from the outer part of the cone. The small seeds then get released from the cone and scattered on the ground.

A female long-horned beetle will lay her eggs in between the cone scales. When the larvae hatch, they chew their way to the center of the cone. Their tunnels cut the water supply to the scales, causing them to dry up and shrink. The scales can no longer hold onto the seeds, so the seeds fall to the ground.





Fire

The seeds need special conditions to start to grow. When a fire sweeps through the forest, it burns the short plants on the ground. This adds nutrients to the soil and creates space for the seeds. When fires burn surrounding trees, more sunlight reaches the ground and helps young seedlings grow.

Growth

As the giant sequoia grows, its cinnamon-red bark splits and becomes thicker every year. In some places the bark can be up to 2 feet thick. This thick bark protects the tree from intense fires. Because of their great size and ability to resist fire, not much can kill a giant sequoia. Lightning may strike the top of the tree but usually does not kill it. These grand trees will continue to grow until a great wind or rainstorm knocks them down.



Sequoia Superhero Challenge

1. What would happen in the forest if there were no Douglas squirrels or long-horned beetles?

2. How is a tree's life different from the life of a person?





For a complete list of plant and animal names on these pages, refer to the Giant Sequoia Teacher's Guide at SaveTheRedwoods.org/GSGuide

Through the Seasons

Try This

Make a list of adjectives to describe the giant sequoia forest during each season: fall, winter, spring and summer. How is the forest similar and different than the area where you live?



Anatomy of a Sequoia

Color This

Hidden beneath the bark of a tree are many layers, each with an important job. Read about the different parts of the tree in the following paragraphs, and color in that part with the suggested color.

■ **BARK:** The outer layer of the tree protects it from damage and disease. The giant sequoia bark contains a chemical, tannic acid, which insects and fungi avoid. The thick bark protects the wood from fire. **Color the bark dark brown.**

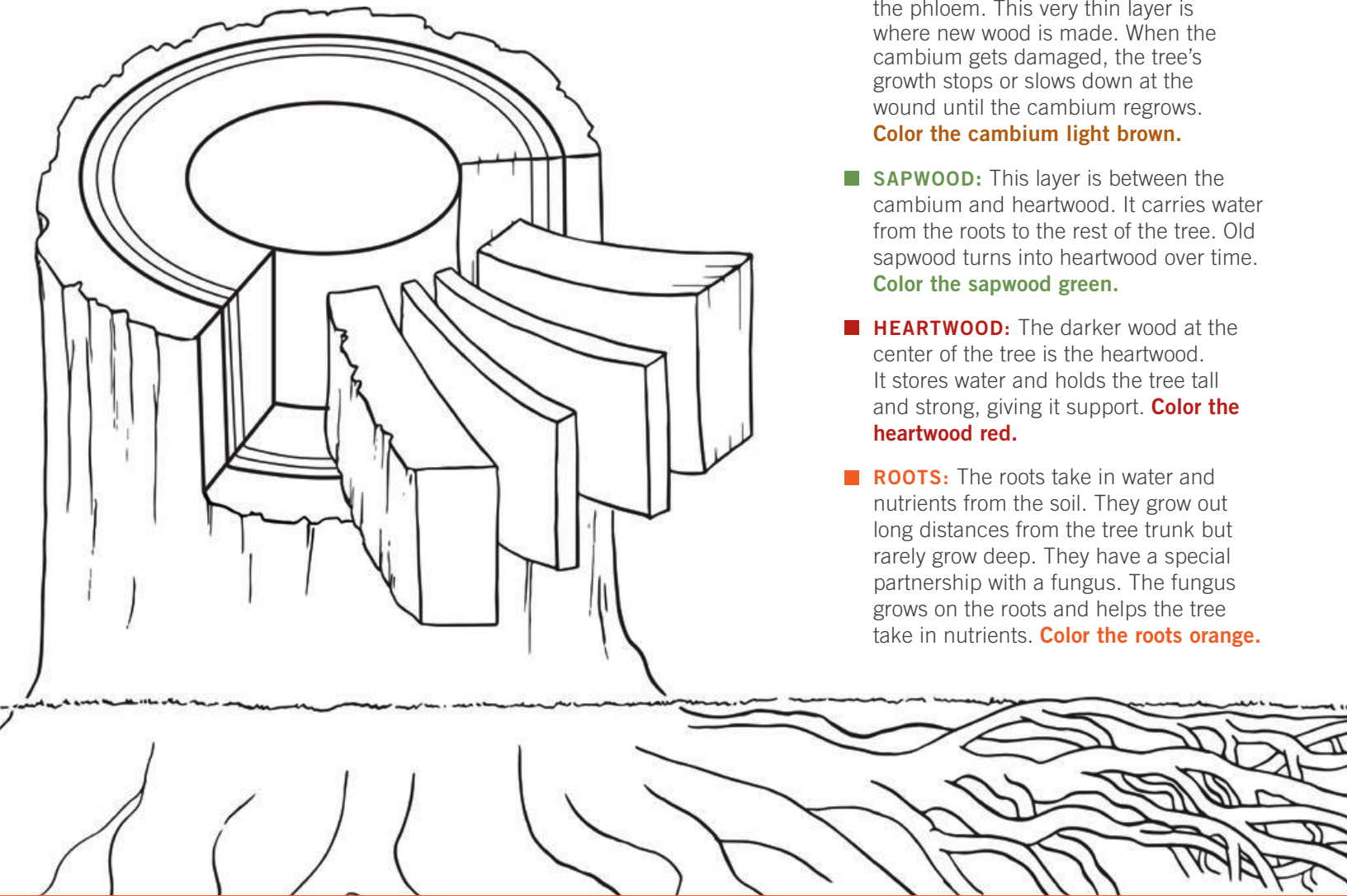
■ **PHLOEM:** Just inside the bark is the phloem layer. The phloem carries the food, mostly sugar, from the leaves to the rest of the tree. **Color the phloem purple.**

■ **CAMBIUM:** The cambium is just inside the phloem. This very thin layer is where new wood is made. When the cambium gets damaged, the tree's growth stops or slows down at the wound until the cambium regrows. **Color the cambium light brown.**

■ **SAPWOOD:** This layer is between the cambium and heartwood. It carries water from the roots to the rest of the tree. Old sapwood turns into heartwood over time. **Color the sapwood green.**

■ **HEARTWOOD:** The darker wood at the center of the tree is the heartwood. It stores water and holds the tree tall and strong, giving it support. **Color the heartwood red.**

■ **ROOTS:** The roots take in water and nutrients from the soil. They grow out long distances from the tree trunk but rarely grow deep. They have a special partnership with a fungus. The fungus grows on the roots and helps the tree take in nutrients. **Color the roots orange.**



Sequoia Superhero Challenge

How long are a sequoia's roots?

STEP 1: Measure the length of the roots in this drawing from the base of the tree to the tip of the roots, in inches. _____

STEP 2: Multiply this number by 300 to get the actual giant sequoia root length in inches. _____

STEP 3: Now measure the length of your feet in inches. _____

STEP 4: How many of your footprints would it take to equal the length of the giant sequoia roots? _____

Become a Sequoia Superhero!

The giant sequoia need your help. There are many actions, big and small, that can help protect our giant sequoia trees and all the plants and animals that live in their forests.

☐ Visit a park!

Plan a trip with your family to visit a giant sequoia park by going to our redwood parks map at DiscoverRedwoods.org. Find activities to do at the park by visiting our Redwoods Learning Center webpage at SaveTheRedwoods.org/learning-center.

☐ Inspire others!

Learn more about sequoia forest plants and animals and share what you learn with your family and friends. Draw pictures, write stories, take photographs and share your new sequoia knowledge with Save the Redwoods League. Email education@savetheredwoods.org

☐ Become a community scientist!

Help Save the Redwoods League look for changes in the forest by taking pictures as you hike around. Collect data for one of our science projects with your camera or smartphone. Look for fiddleheads on ferns and blooming flowers within the sequoia forest. Find out more at SaveTheRedwoods.org/community-science.

Try
This

Try these activities at home with your families.

1. CREATE AND EAT A PLANT-PARTS TACO!

At your house or local store, find fruits and vegetables that come from different parts of a plant. On a plate, lay down a piece of lettuce or other leafy green. On top, place a cut up root (carrot, beet, radish). Next, add a stem (celery). Throw in a few pieces of fruit (strawberries, blueberries, kiwi), and sprinkle seeds on top (sesame, pumpkin, sunflower). Fold the lettuce or leafy green around all the ingredients, add your favorite dressing, and eat away!

2. FIND CONES IN YOUR NEIGHBORHOOD

Compare their size to the giant sequoia cone on this page. Are most of the cones smaller or larger than the giant sequoia cone? Measure the cones with a ruler. How many centimeters or inches bigger or smaller are they than the giant sequoia cone?

3. GROW A PLANT AT HOME

The best way to learn how a plant grows is to try it yourself.

STEP 1: Go to a local nursery and ask them for native plant seeds or vegetable seeds. You can try pumpkin or radish seeds, which grow quickly.

STEP 2: Take an old egg carton and fill each cup with good soil or compost. Place a couple seeds in each section just slightly under the surface of the soil. Give the seeds a little water. Continue to water the seeds when the soil feels dry. Place seeds in a sunny location.

STEP 3: Hopefully within a week you will see your plants begin to grow.



Giant Sequoia Word Search

CHICKAREE CONE FIRE GIANTSEQUOIA JOHNMUIR
NATIONALPARK PHLOEM ROOTS SEEDLING SNOW



Whose Tracks Did You Find?

Could you identify all six of the animal tracks in the snow on the bottom of the pages? Use this list to check them off.

- Douglas squirrel
- Coyote
- Black bear
- Bobcat
- Mule deer
- Deer mouse
- I got them all! I'm a giant sequoia expert!!**



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