

Junior Ranger Activity Book

National Park Service
U.S. Department of the Interior

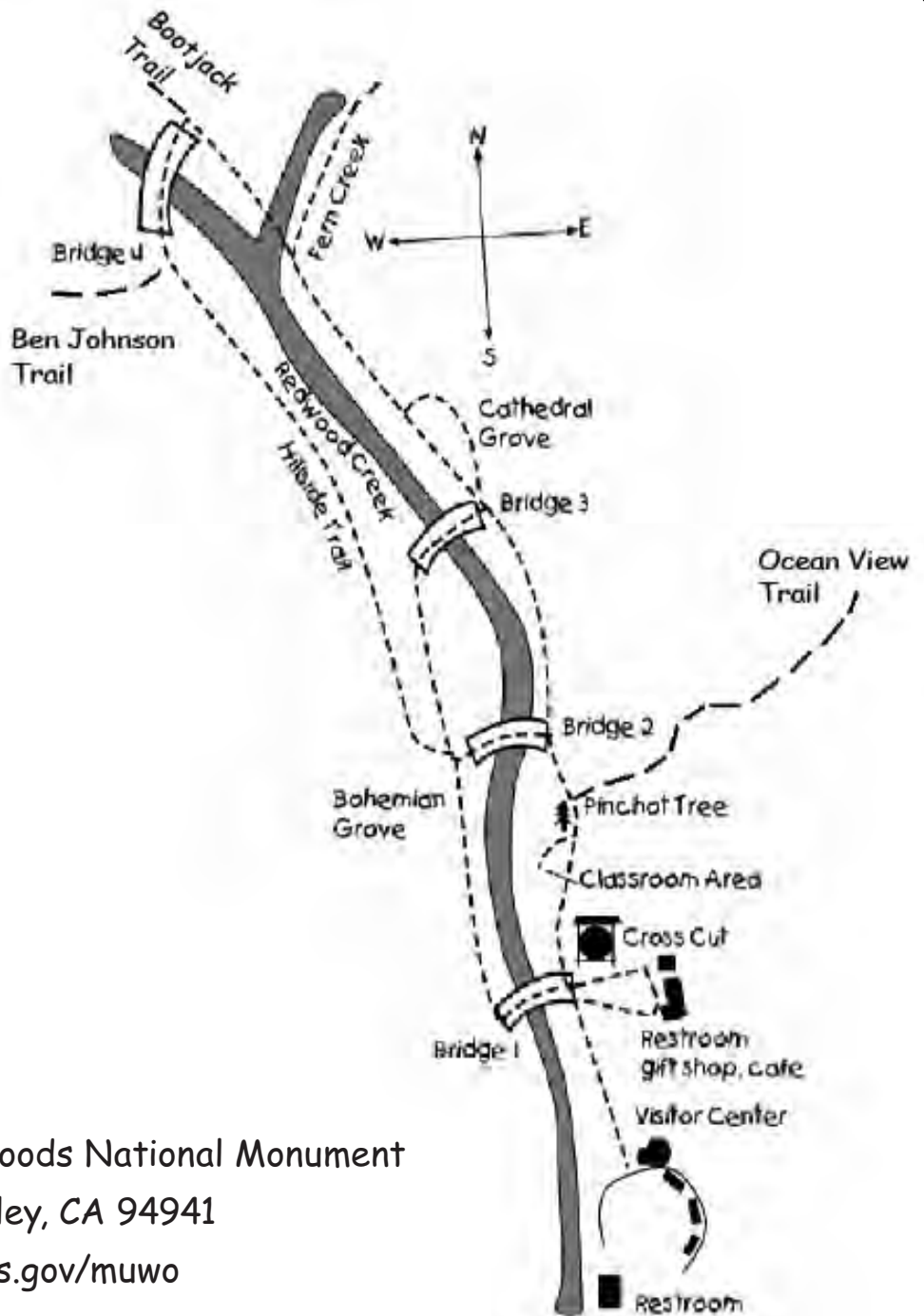
Muir Woods National Monument
Golden Gate National Recreation Area



Name: _____

Date: _____

Weather: _____



Muir Woods National Monument
 Mill Valley, CA 94941
www.nps.gov/muwo

Welcome to Muir Woods National Monument

This redwood forest is protected by the National Park Service so that everyone may enjoy its beauty and importance. Your job as a Junior Ranger is to find out what makes redwood forests so special.

But first, there are a few things to remember in every National Park:

- Stay on the trail
- Leave only footprints (no littering)
- Take only memories
- Have fun



Junior Ranger Pledge

I promise to preserve and protect the plants, animals, and history of the national parks and my community by observing the park rules and showing respect for the environment wherever I go.

Junior Ranger Challenge

Think of two more things you can do to help protect the National Parks. Write them here:

A large, empty rectangular box with rounded corners, outlined with a dashed line, intended for writing two more things to help protect the National Parks.



© Larry Eifert

Before you begin your hike, sit down and take a moment to listen to your surroundings.

Write down four sounds you hear that belong in nature.

1. _____
2. _____
3. _____
4. _____

Write down four sounds you hear that do not belong in nature.

1. _____
2. _____
3. _____
4. _____

How do you think the sounds will change as you walk into the forest?

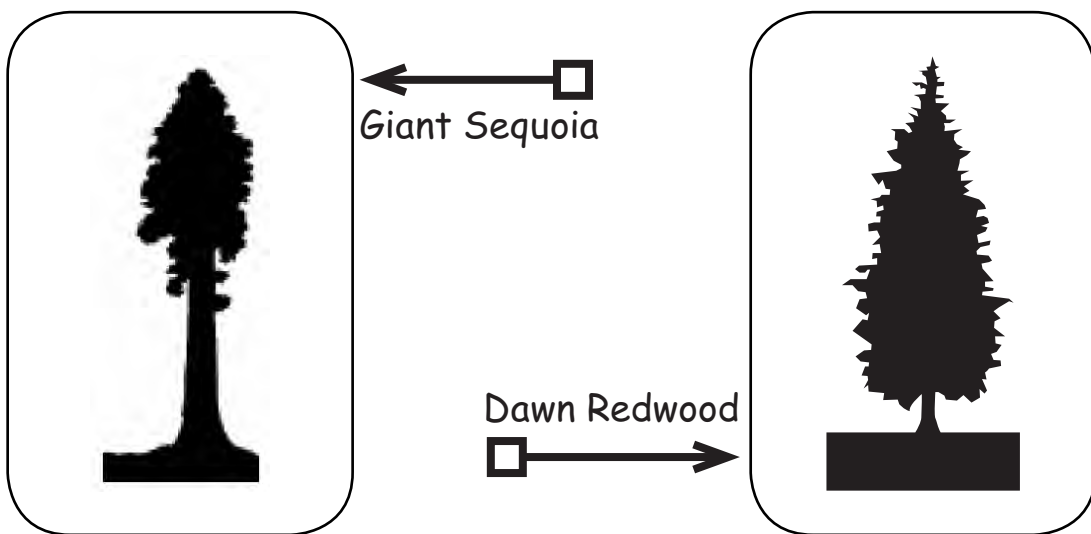
Take some time to listen as you walk through the forest today. You never know what you might hear.

Go past bridge one to the "Redwoods and Their Relatives" exhibit.

The Coast Redwood tree has relatives living in many other countries.

Look at the map. Find the Giant Sequoia that lives in California and the Dawn Redwood that lives in China.

They are the two closest relatives of the Coast Redwoods.



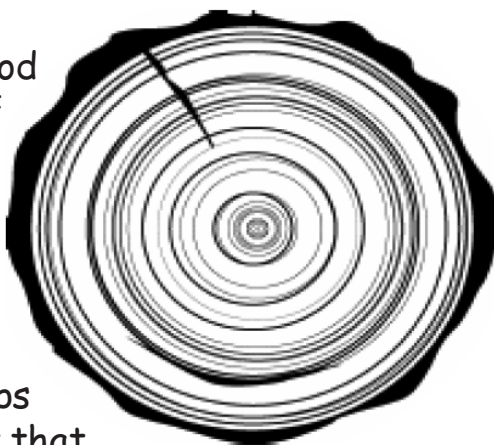
Can you find number 13 on the sign? This tree is the national tree of Mexico. What is its name?

Number 6 is a sacred tree in Japan. What is its name?

Find where you live on the map. Which redwood relatives live closest to you?

Go to the Cross section exhibit.

You can tell how old a fallen redwood tree is by looking at the rings of the cross section. A cross section is a big round slice from the trunk of a fallen tree, like when carrots are sliced into thin circles.



Each ring is one year of a tree's life. The ring has a light part that develops during the spring and a dark part that develops in the summer, fall, and winter.

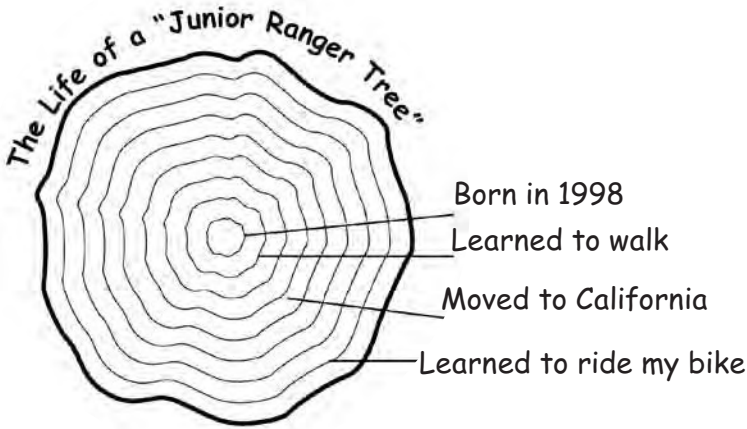
Junior Ranger Challenge

Take a look at the cross section; can you figure out how old it is? Subtract the year it was born from the year it fell and write the answer here:

Tallest Trees

Did you know that the tallest tree in the world is a coast redwood? Can you see the top of a redwood tree? The tallest redwood is over 379 feet tall. That's 74 feet taller than the Statue of Liberty! The tallest tree at Muir Woods is over 260 feet tall. That's as tall as 64 kids stacked on each other's heads.

6 "Immortal sequoia life to you" *9* -John Muir

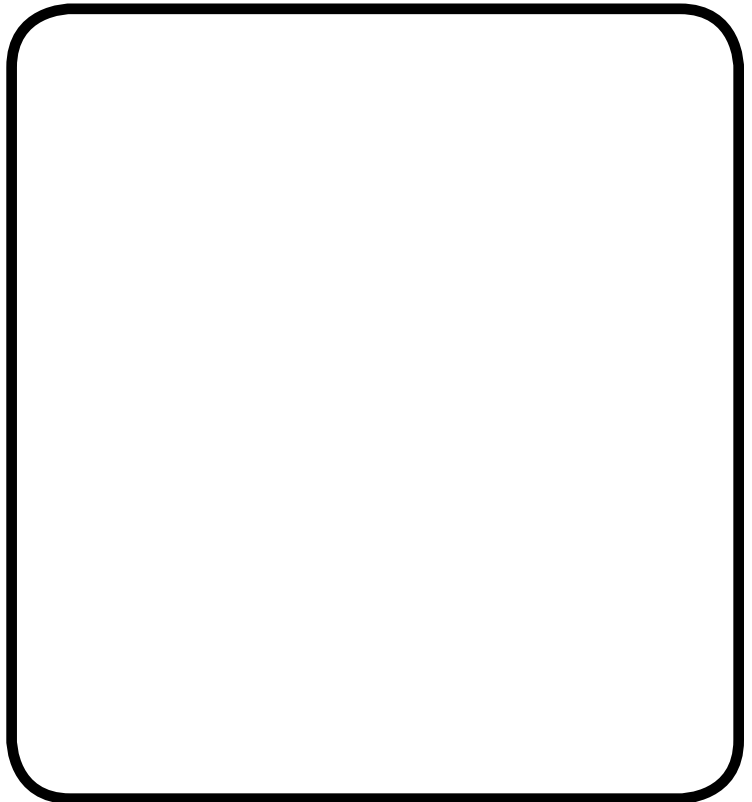


Rings of Life Activity

Draw a ring diagram of your life showing every birthday you have had. There should be as many rings as the number of years old you are. Include in your drawing all the important times in your life.

How old are coast redwoods?

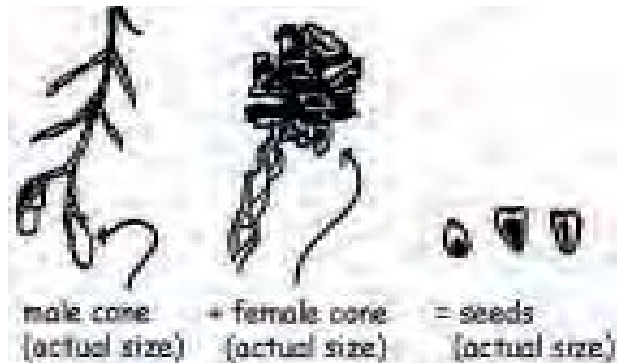
Redwood trees are very old. The coast redwoods have been on earth for over 150 million years, since the time of the dinosaurs! The average age of the redwood trees in Muir Woods is between 500-800 years. The oldest trees here are over 1000 years old. The oldest known Coast Redwood tree is 2200 years old.



Continue along the trail. STOP and read the "Family Circles" and "From These Small Seeds" exhibits.

How do redwoods reproduce?

Find a large lump on a redwood tree. It is called a BURL. A burl is a mass of redwood tissue that is about the same color as the bark. Burls can be found on the trunk or on the roots. When a tree is stressed or hurt from fire, a strong wind, or humans, the burl will send up new sprouts.



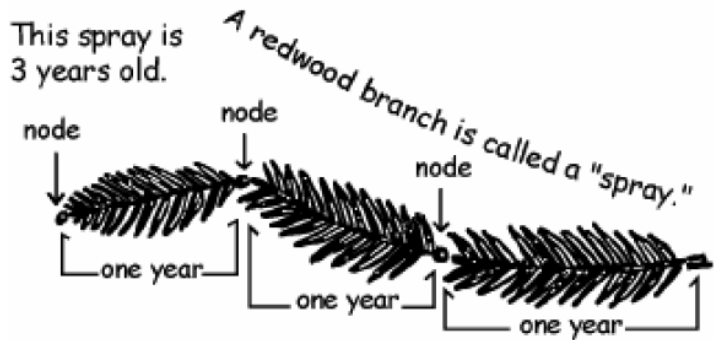
Trees that grow close together and in circles sprouted from burls on the roots. They are called family circles. How many family circles do you see growing around you?

Trees that are standing all by themselves sprouted from seeds. How many trees can you find that grew from a seed?

Junior Ranger Challenge

In the space below sketch a cluster of redwoods (also known as a family circle) growing from the roots of a parent tree. Label it "Burl."

Now draw a tree standing all alone in the space below. Label it "Seed."



Junior Ranger Challenge

Look on the ground and find a long redwood spray.

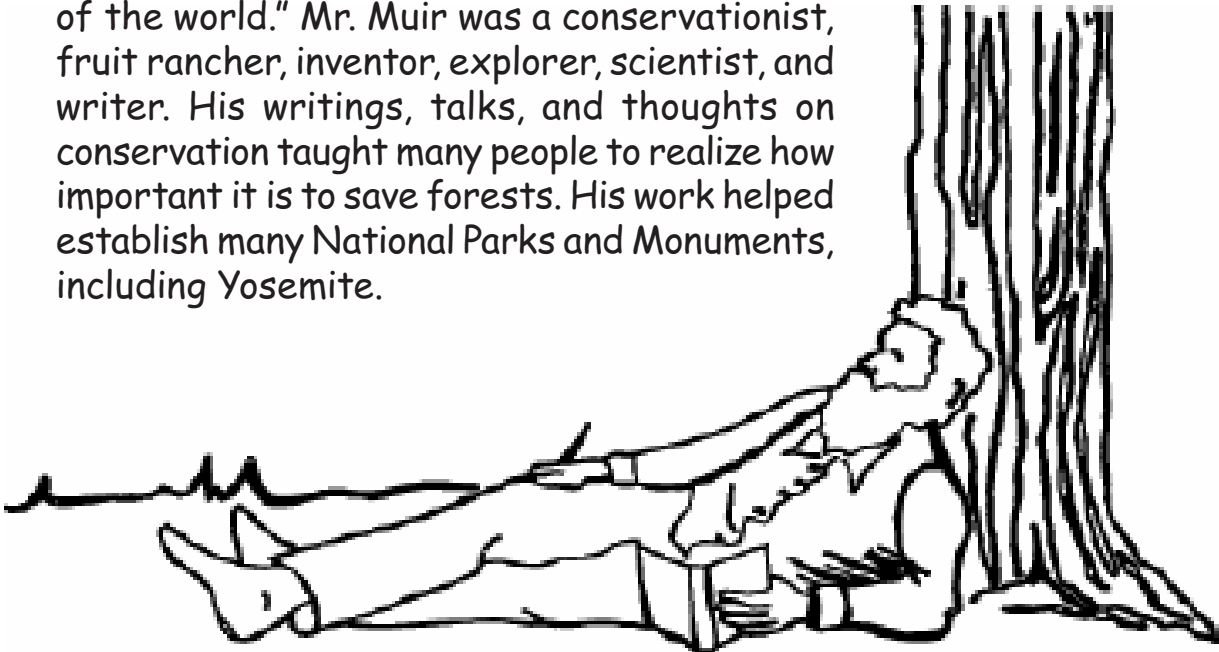
You can count the nodes or bare spots to tell how old it is. Each year a node grows at the end of a spray, so a branch is as old as the number of nodes. Write down the age of your redwood spray:

Go to the Pinchot Tree. (Rangers often give talks here. You can stop and listen if you want to.)

In 1905 William and Elizabeth Kent bought this old growth redwood forest. The Kents asked their friend Gifford Pinchot for advice on how they could protect it forever. Mr. Pinchot suggested they donate the forest as a national park. In 1908, President Theodore Roosevelt declared their gift a National Monument and named it _____ after John Muir.

Who was John Muir?

John Muir, for whom this forest was named, said "This is the best tree lover's monument that could possibly be found in all the forests of the world." Mr. Muir was a conservationist, fruit rancher, inventor, explorer, scientist, and writer. His writings, talks, and thoughts on conservation taught many people to realize how important it is to save forests. His work helped establish many National Parks and Monuments, including Yosemite.

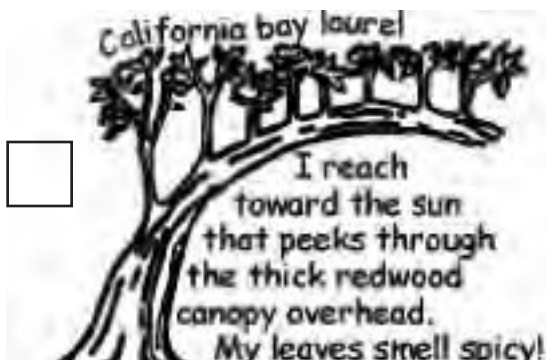
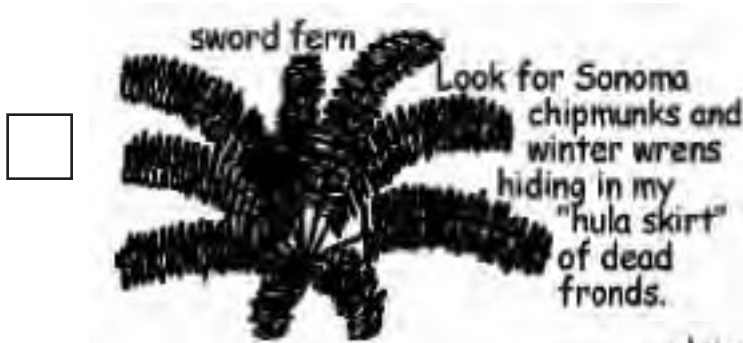


Continue walking on the main trail. Find a shady place on the trail.

Look up...do you see the ceiling of redwoods above you? The "ceiling" in a forest is called the canopy. The canopy soaks up much of the sunlight allowing shade loving plants to thrive on the forest floor.

Junior Ranger Challenge

Below are drawings of plants that love the shade and a tree that has adapted to reach for the sun. Find them in the forest near you. Put a check next to the plant when you find it.



Animals of Muir Woods

Muir Woods provides a home to a wide variety of animals. Some of the animals only eat plants. They are called herbivores. Other animals only eat meat. They are called carnivores. When a carnivore is hunting another animal it is called a predator. The animal being hunted is known as prey.

Junior Ranger Challenge

Draw a line from the Muir Woods predator in the left hand column to its prey.

Predator



Mountain Lion



Northern Spotted Owl



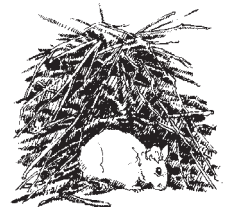
California Giant Salamander



Great Blue Heron

Prey

Dusky Footed Wood Rat



Young Coho Salmon



Banana Slug



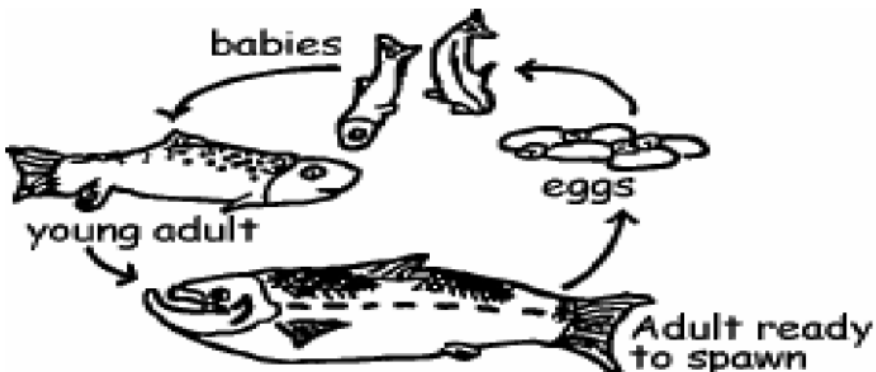
Black-Tailed Deer



Go to bridge 2.

Redwood Creek

Take a look in Redwood Creek and you may be lucky to see a coho salmon or steelhead trout. This creek is one of the few natural habitats for these endangered fish. Can you believe they depend on the redwood trees to survive? The trees that fall into the creek cause the water to slow down and the gravel to build up. Salmon lay their eggs in beds of gravel. Fish hide under fallen trees in the creek so they don't get eaten by other animals. The plants growing along the banks of the creek prevent too much soil from eroding into the water and choking the fish.



Junior Ranger Challenge

What ocean does Redwood Creek flow into?

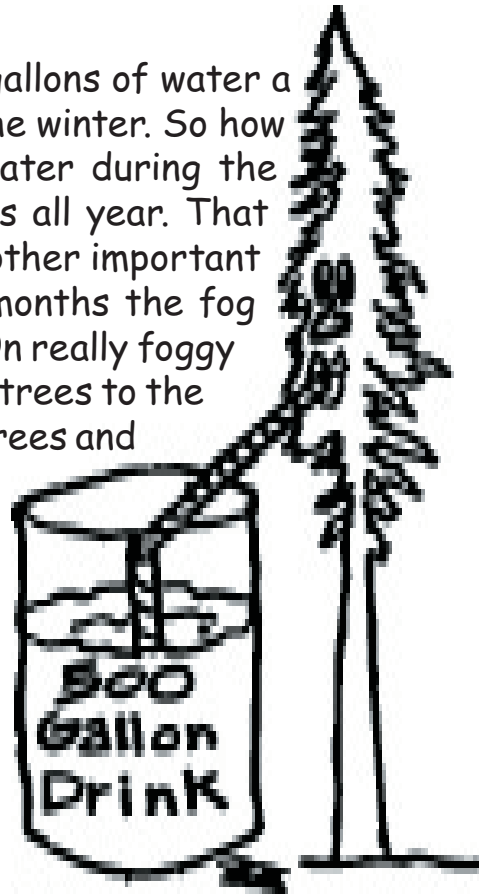
List three things you can do to keep the creek and ocean clean.

1. Don't throw coins in the water.
- 2.
- 3.

Continue walking along the main trail. STOP when you find a redwood tree growing near the creek.

Junior Ranger Challenge

Redwoods can drink up to 500 gallons of water a day! It rains here only during the winter. So how do the trees and plants get water during the other seasons? The creek flows all year. That is one good source of water. Another important source is fog. During the dry months the fog comes rolling in off the ocean. On really foggy days, the fog drips from the tall trees to the ground. This fog drip gives the trees and the plants of the forest over ten inches of water each year.



Three sources of moisture for a thirsty redwood tree are:

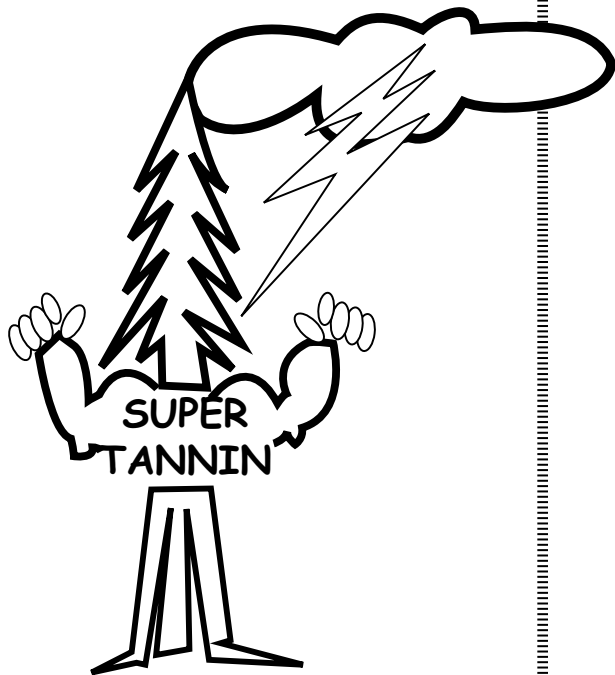
1. _____
2. _____
3. _____

Go into Cathedral Grove. Take the path to the left. Look for trees that have been hollowed out.

What happened?

Fire!

Fire is very important for a natural forest. It burns dead leaves, branches, and plants on the forest floor. The burned material makes the soil rich and full of food for plants. This helps redwood seeds sprout and grow up to be tall trees. Redwood trees protect themselves from fires with their bark, which can be up to a foot thick. Inside their bark is a special chemical called tannin. The tannin makes the tree red and protects it from fires, insects, and rot.



Can you find evidence of fire in Muir Woods. What is your clue?

Continue walking through *Cathedral Grove*. Find a quiet place to sit.

Take a moment to listen carefully to the forest. Write down five sounds that you hear.

1. _____
2. _____
3. _____
4. _____
5. _____

What are the most beautiful sounds you hear?



Junior Ranger Challenge

Take a moment to think about the time you spent exploring *Muir Woods*. Can you think of three different ways to share your experiences with others?

1. _____
2. _____
3. _____

Junior Ranger Challenge

Create a poem about the redwood trees. You might want to write about the size, shape or color of the trees. Be sure to include a line about the forest and what you hear. Look at the map on page one to help plan the rest of your hike at Muir Woods. Stay on the trail to avoid Poison Oak.

FUN FACT

Poison Oak is a plant that makes people itchy if they touch it, but deer like to eat the green, sometimes red, shiny leaves of three. Remember: "Leaves of three, let them be."



BONUS ACTIVITY

You can complete this at Muir Woods,
or do it when you get home.



ACROSS

1. The ceiling of the forest
5. Endangered fish that are in Redwood Creek
7. A person who promised to preserve and protect the environment
8. Particles in the air that give the trees and plants water.
9. A plant that likes the shade.
10. Falls from the tree to grow new redwood trees.

DOWN

1. The tallest living thing in the world.
2. The person Muir Woods is named after.
3. A chemical in redwood trees that protect them from rot, fire, and insects.
4. Device used to find directions.
6. A mass of redwood tissue found on the tree and on its roots.
8. Burns dead leaves and branches and makes the soil full of food for plants.

CONGRATULATIONS!!!

You have completed the Junior Ranger Challenge.

Your Muir Woods Junior Ranger Certificate may be obtained by answering these four questions:

1. What are the two ways that redwoods reproduce?
2. What chemical gives the redwoods their color and helps protect them from fires, insects, and disease?
3. What endangered species live in Muir Woods?
4. What did you find special about your visit today?

Leave the answers to these questions at our Visitor Center with your full name and address. You can also mail the answers to us at:

*Muir Woods National Monument
Junior Ranger
Mill Valley, CA 94941*

OR you can e-mail the answers to us at:

goga_muir_woods_nm@nps.gov

When you get home, you may want to visit our website at: www.nps.gov/muwo to learn more about Muir Woods National Monument.

Animal answers: Mountain Lion, Black Tailed Deer, Northern Spotted Owl, Dusky Footed Wood Rat, California Giant Salamander, Banana Slug, Great Blue Heron, Young Coho Salmon
Crossword answers: Across: 1) canopy 5) coho salmon 7) junior ranger 8) fog 9) sword fern 10) seeds. Down: 1) coast redwood 2) John Muir 3) tannin 4) compass 5) burl 8) fire

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Full Name: _____

Address: _____

EXPERIENCE YOUR AMERICA