



Help the Plant Heroes protect our forests  
by slowing the spread of pests and diseases!

# WHITE PINE BLISTER RUST

PLANTHEROES.ORG  
BEGINNER  
ACTIVITY  
BOOK

**Nate Green**



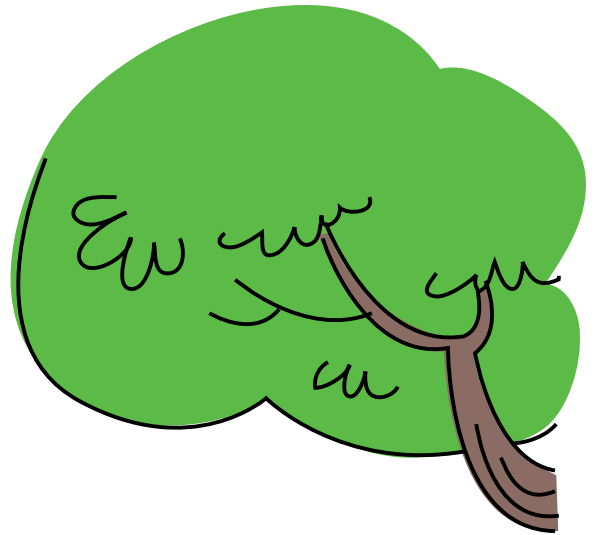
**BE A PLANT HERO!**  
Help Nate slow the  
spread of White Pine  
Blister Rust!



Plant  
Protection  
Program

AMERICAN PUBLIC GARDENS ASSOCIATION

# Meet the PLANT HEROES!



## LAURA WILKINS

From: Athens, Georgia  
Hobbies: playing the trumpet,  
gardening, studying ecology

## FRANKIE BARKER

From: Shrewsbury, Massachusetts  
Hobbies: climbing trees, camping

## NATE GREEN

From: Tacoma,  
Washington  
Hobbies: going on  
adventures, learning  
about fungi

## APONI STAR

From:  
Southeast  
Illinois  
Hobbies:  
learning  
more about  
entomology  
(the study of  
insects)



[plantheroes.org](http://plantheroes.org)

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The Plant Heroes are four friends who love spending time in nature more than anything else! They enjoy climbing trees, walking trails, and camping.

The heroes are learning about why our forests are in danger. There are insects and fungi that can impact trees, sometimes affecting the health of whole forests. Trees may become sick or die when they are weakened by an invasive species, a living thing that is introduced to a new environment where it can cause damage to existing organisms.

**Follow Nate to learn the story of how he helped slow the spread of white pine blister rust...**



# A 'CURRANT' THREAT



Nate and his parents spent winter break with his older sister, Karen, at her new home near Salt Lake City, Utah. They spent a bunch of time on the slopes and the snow was awesome!

Several months later they are getting ready for another visit ...

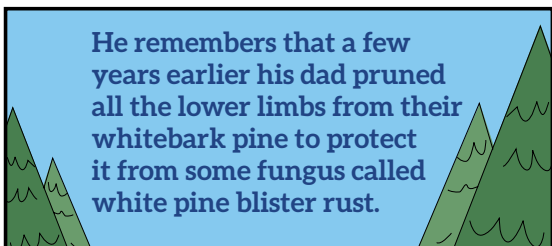
Nate's mom suggests that he dig up a few small black currant bushes from the backyard and bring them to Karen for her garden.



When Nate starts digging up the currant plants the next day, he notices that a lot of leaves are covered in orange spots.



He remembers that a few years earlier his dad pruned all the lower limbs from their whitebark pine to protect it from some fungus called white pine blister rust.



## HANG ON!!

What was the funny name of those pines I didn't recognize at Karen's last winter... limber pine? Is that some kind of white pine?

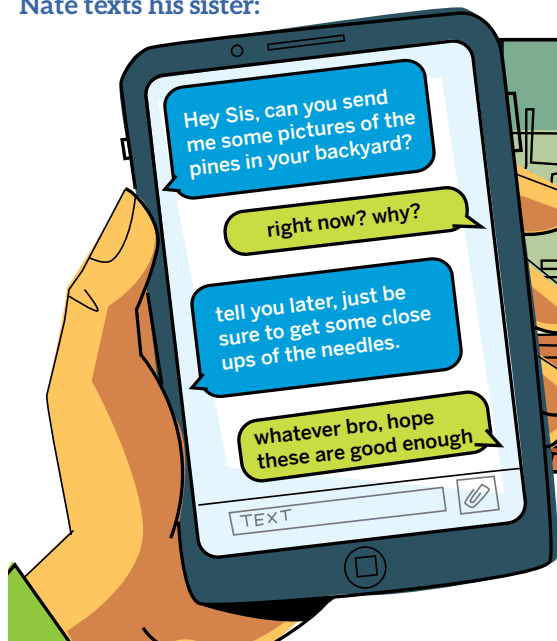
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He looks it up on his phone and learns that all white pines have needles in bundles of five and that limber pine is in that group.

Nate texts his sister:



The pictures arrive and Nate was right ...

# FIVE NEEDLES!!

“MOM! If we bring these plants, we might infect her pines with a deadly disease! Maybe we should find something else for her while we’re there.”



They wait, and, sure enough, they find a native plant nursery in Salt Lake City that specializes in edibles. The owner explains that white pine blister rust hasn’t been found in Utah yet, and they hope it never is.



He helps them pick out some choke-cherry and elder-berry bushes for Karen’s place and even sends them home with some samples of their fruit.

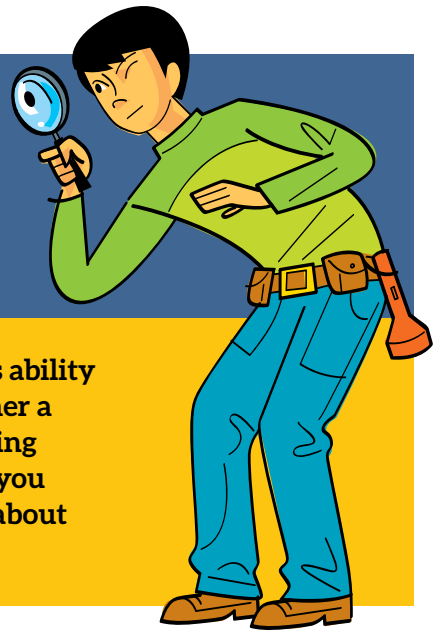


They put the plans in the ground that afternoon and then do some celebrating in the kitchen. Maybe it’s knowing that they weren’t the ones to introduce white pine blister rust to Utah, but everyone agrees, Karen’s scones taste extra sweet today!

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# What Is White Pine Blister Rust?



White pine blister rust is a type of fungus that damages a white pine tree's ability to get food to its leaves. A fungus is a living organism or being that is neither a plant nor an animal. Fungi are the great recyclers of the environment, taking their nutrition from organic matter (like a tree). Some common fungi that you might recognize include mushrooms and molds. The rust we are learning about today, white pine blister rust, infects currants and white pine trees.



This part of its name comes from the trees that it damages.



## WHITE PINE BLISTER RUST



The fungus is also named after the "blisters" it makes in tree bark.

### DID YOU KNOW?

Not all fungi are harmful. Some fungi help plants get nutrients from the soil to grow!

#### HANDY TIP!

"Fungi" means more than one fungus;  
"fungus" means just one fungus.

This last part of the name comes from the rust-colored spots on infected leaves.



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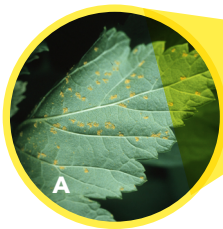
# A Complicated Life

The life cycle of white pine blister rust is a complicated one. To complete its life cycle, the fungus infects not just one but two different plants. Follow the life cycle of white pine blister rust through the maze to learn more!

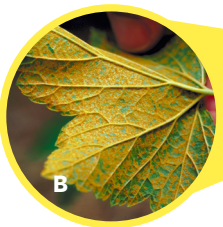


**START** →

**1.** In the spring, a white pine tree with white pine blister rust gets white bumps on its trunk that contain spores, which act as "seeds" for a fungus.



**2.** Spores from the fungus float in the air and land on currant leaves in the spring.



**3.** Throughout the summer, orange spots appear on the underside of currant leaves. The spots produce more spores that also float through the air.



**4.** Spores land on a white pine tree and the fungus starts to grow. As the fungus grows, the tree can no longer transport food, and the branches of the tree begin to die.



**FINISH**



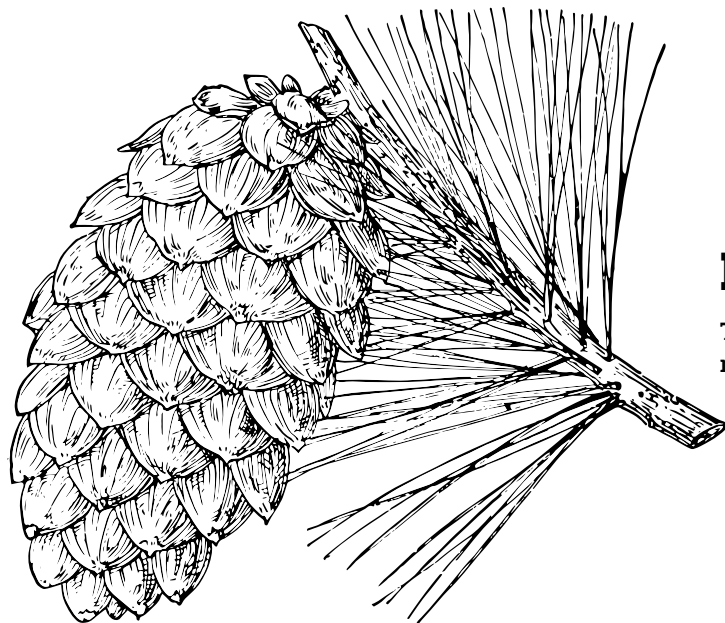
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# Meet the Plants!

Just like you, white pine blister rust has its favorite foods. The fungus has to infect two plants. Below are some of the plants that white pine blister rust enjoys. Can you find any of these plants near you? Color in the pictures of the leaves below.



## LIMBER PINE

This tree produces pine cones and has needles that grow in groups of five.

## MOUNTAIN GOOSEBERRY

In the spring this shrub has pink flowers, and in the summer the plant produces red berries with hairs that you can eat. Watch out! This plant has thorns!





# Everything Is Connected

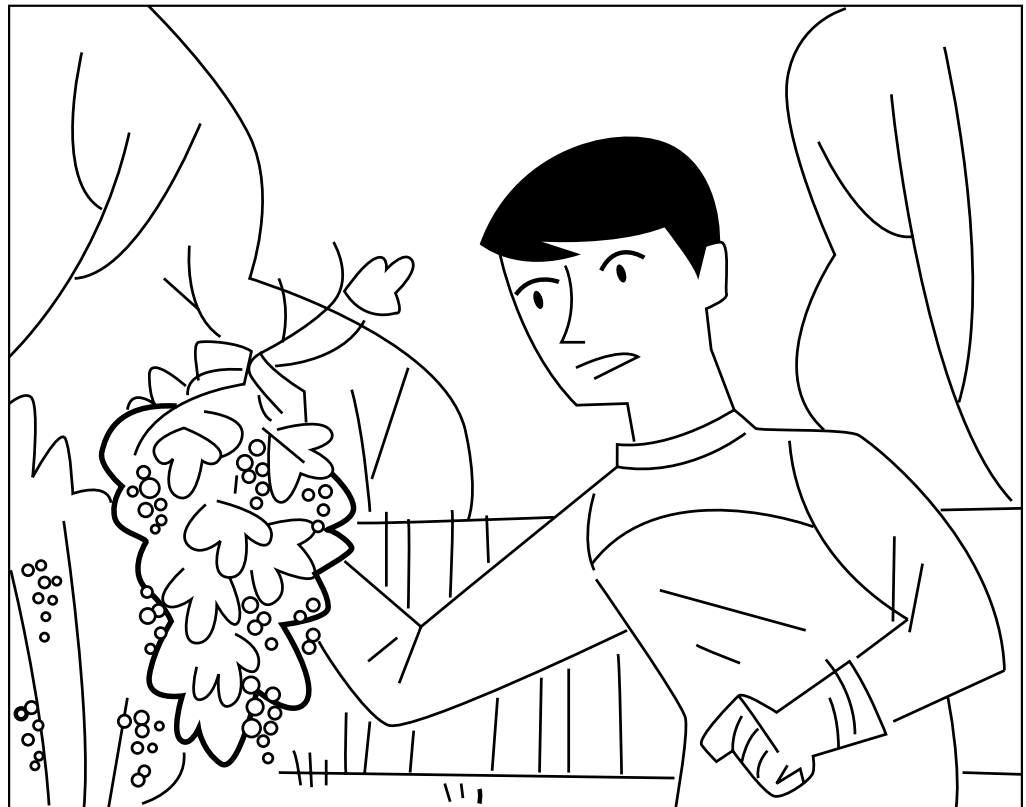
White pine blister rust can impact many different pine species, including the whitebark pine. While this species is not very abundant, it is a very important source of food for animals. With the help of page 7 in your field guide, fill in the blanks using the words below to learn more about the importance of whitebark pine.

## WORD BANK:

**PINE**  
**PINECONES**  
**SEEDS**  
**BIRD**  
**BEARS**  
**SQUIRRELS**  
**GROW**

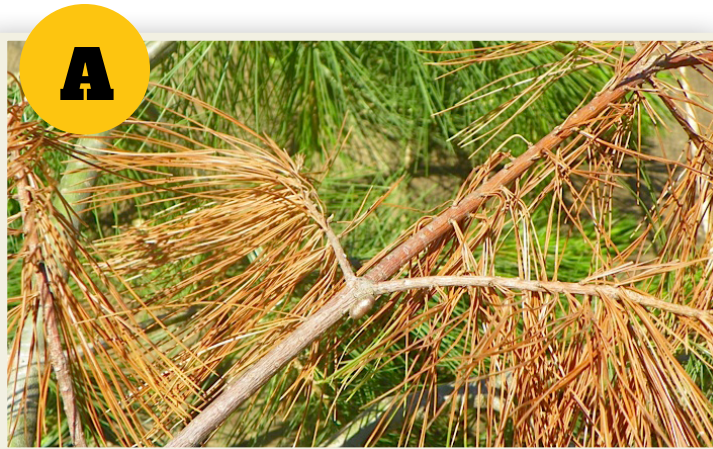
1. Without the whitebark \_\_\_\_\_, the wildlife in the high mountains of the Western United States might look different. Each year the trees produce \_\_\_\_\_ with tasty \_\_\_\_\_.
2. These seeds are an important food source for many animals. The Clark's nutcracker, a type of \_\_\_\_\_, buries the seeds in the ground. New trees \_\_\_\_\_ from the Clark's nutcracker's stashes.
3. \_\_\_\_\_ and \_\_\_\_\_ also feed on the whitebark pine seeds.

Color the picture of Nate noticing orange spots on the currant plants!



# Plants in Trouble

White pine blister rust leaves signs that it has infected plants. See if you can use your detective skills. Match the photo with its description to learn more about the signs you might spot if the fungus has infected the plant.



\_\_\_\_\_ Currant leaves with yellow or orange spots



\_\_\_\_\_ Dead needles or branches on a white pine tree



\_\_\_\_\_ White bumps or "blisters" on the bark of a white pine tree



# Time to Journal!



The coolest thing I learned in this book is

.....

.....

.....

My favorite thing about white pine blister rust is

.....

.....

.....

Have you seen any pine trees near where you live? If so, draw one below! Notice how many needles it has per group!

## ANSWER KEY

**Everything Is Connected:** 1. pine, pinecones, seeds; 2. bird, grow; 3. squirrels or bears

**Plants in Trouble:** A) Dead needles or branches on a white pine tree; B) White bumps or “blisters” on the bark of a white pine tree; C) Currant leaves with yellow or orange spots





Join our team of Plant Heroes and learn about trees, forests, and the natural world around you!

**PLANTHEROES.ORG**

### You can be a Plant Hero!

Are you curious about plants and animals? Do you like asking questions about nature? Do you enjoy being outdoors and having fun, climbing trees, balancing on logs, or finding a new butterfly or beetle? If so, you are already on your way to becoming a Plant Hero! We invite you to join forces with Nate, Laura, Aponi, and Frankie to protect the plants and ecosystems we all love.

### How can you become a Plant Hero?

Join our team and go on a journey with Nate, Aponi, Laura, and Frankie. As a Plant Hero, you will learn to notice when plants are in trouble. You will also find out ways you can act quickly to help find solutions in your own neighborhood. Follow their adventures and learn how they help plants and ecosystems stay healthy.

**On the Plant Heroes website, you will find** materials to help you learn about plants, forest health, and ecosystem balance. The more you know, the more you can help protect plants and ecosystems in your own yard, neighborhood, and community!

**Plant Heroes strives to spark curiosity about nature and science in all children.** Our program provides hands-on, nature-based learning materials for educators to engage children in topics of plant health, ecosystem balance, and forest health. We also spotlight the amazing work our public gardens do in protecting the plants and ecosystems we all depend on through our website and printed materials. Visit [plantheroes.org](http://plantheroes.org) today to learn more!

**Plant Heroes is brought to you by the American Public Gardens Association**, founded in 1940. Over the last eight decades, the Association has supported the work of public gardens in North America and beyond. Our mission is to champion and advance public gardens as leaders, advocates, and innovators in the conservation and appreciation of plants. Our vision is "A world where public gardens are indispensable" as they provide botanic, conservation, community, education, and economic resources to their community.

The Association is committed to increasing the knowledge of public garden professionals throughout North America through information sharing, professional development, networking, public awareness, and research, so that they have the tools to effectively serve visitors and members.



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