

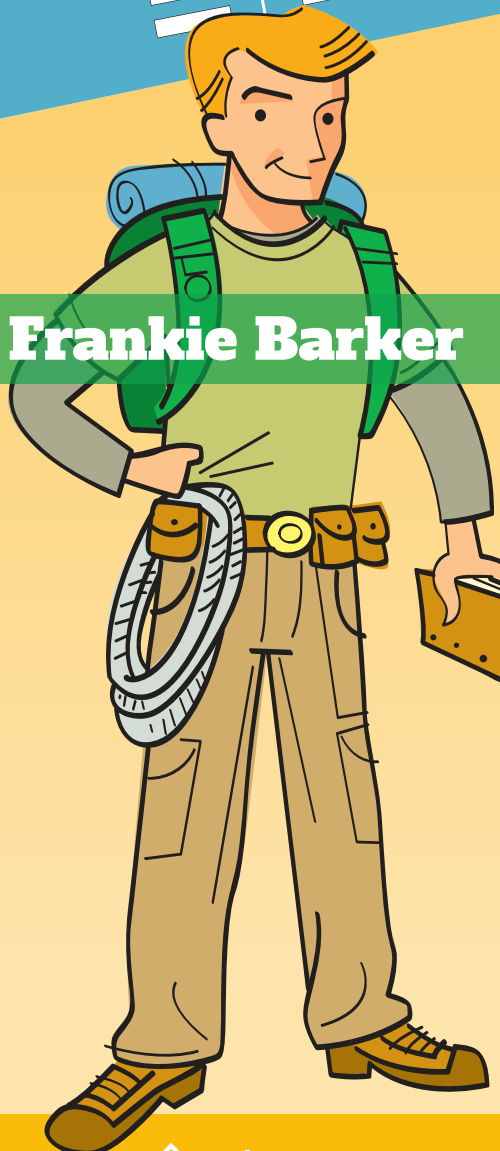


Help the Plant Heroes protect our forests
by slowing the spread of pests and diseases!

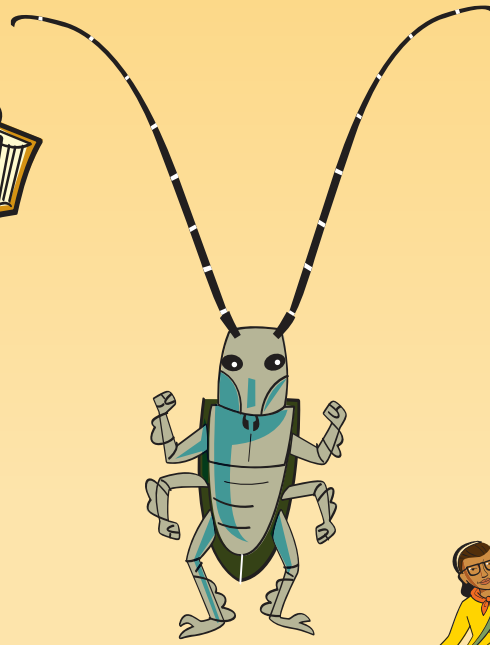
INSECT | **ASIAN
LONGHORNED
BEETLE**

**PLANTHEROES.ORG
ADVANCED
ACTIVITY
BOOK**

Frankie Barker



BE A PLANT HERO!
Help Frankie slow the
spread of the Asian
longhorned beetle!



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

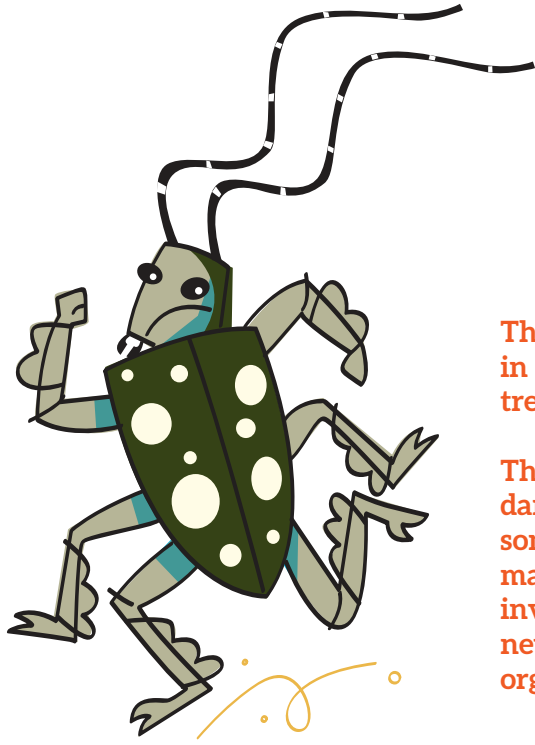
APONI STAR

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



plantheroes.org

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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.

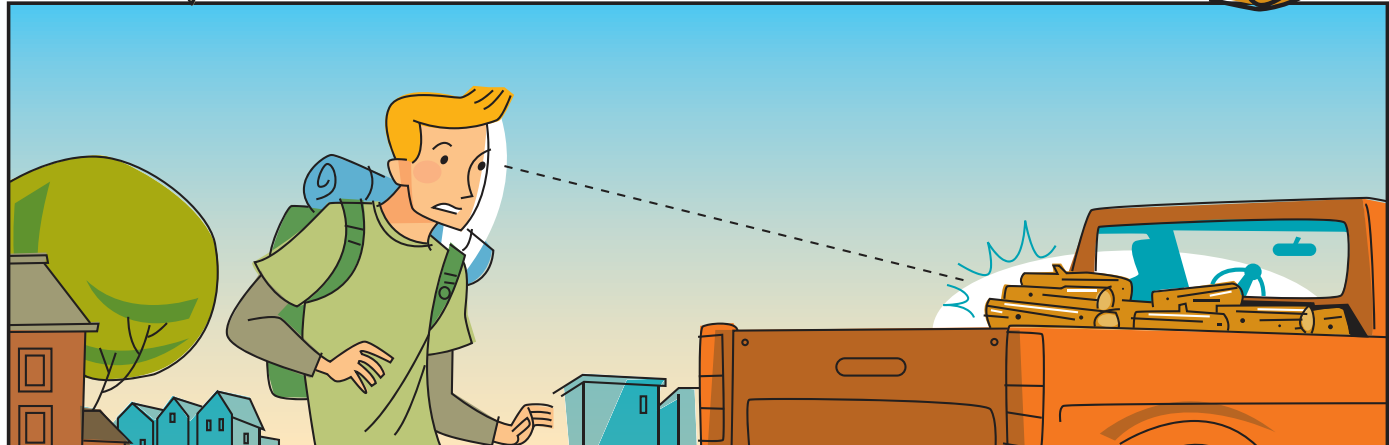
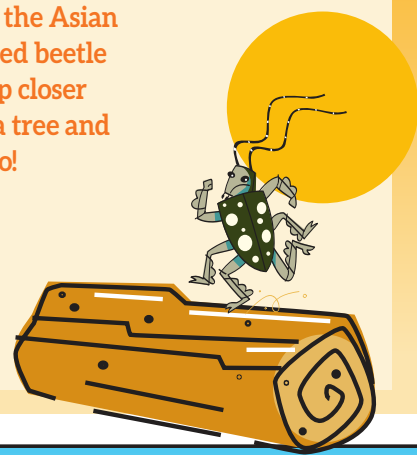
Follow Frankie to learn the story of how he slowed the spread of the Asian longhorned beetle...



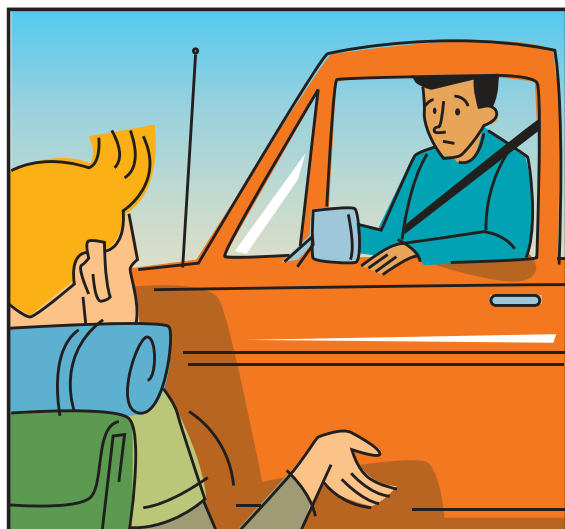


NOT GOOD TO MOVE FIRE WOOD

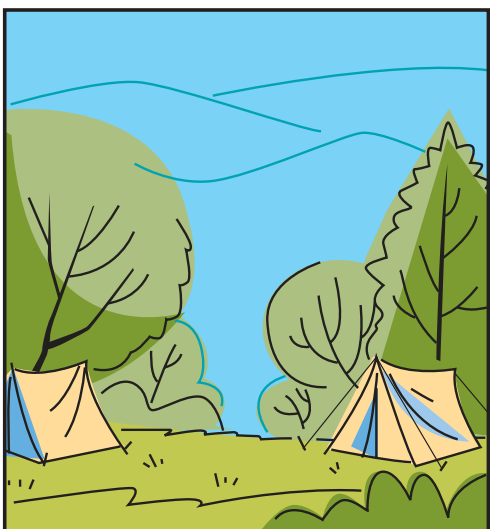
Understanding how firewood enables the spread of the Asian longhorned beetle is one step closer to being a tree and plant hero!



When Frankie's Eagle Scout troop comes by to pick him up for a weekend camping trip to nearby Wachusett Mountain State Reservation, Frankie sees a load of firewood in the back of his friend's pickup truck.



When he asks where the wood came from, Frankie's friend says his dad cut down a dead tree in their back yard. Frankie knows they both live within the Asian longhorned beetle quarantine area and understands that transporting the firewood could help spread the insect to other areas.

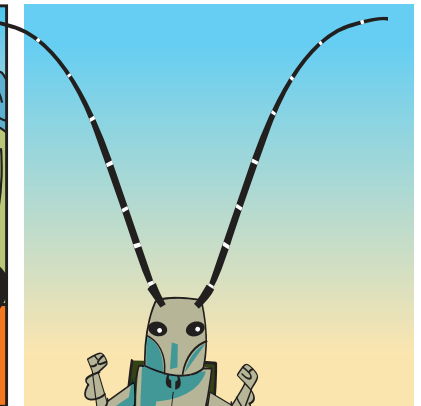


USE FIREWOOD WHERE YOU FIND IT. STOP ASIAN LONGHORNED BEETLE FROM TRAVELLING!

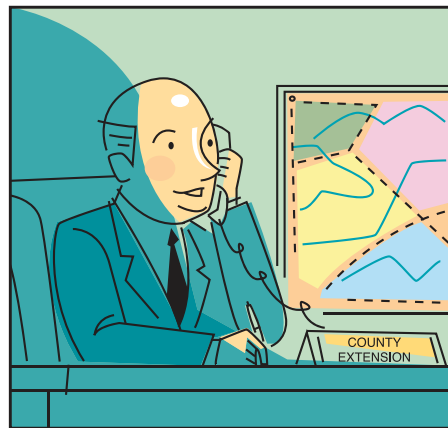
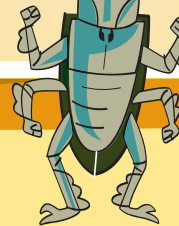
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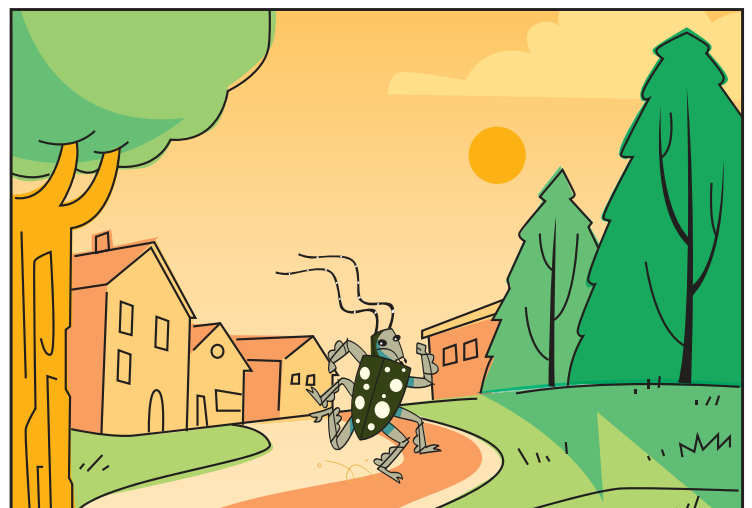
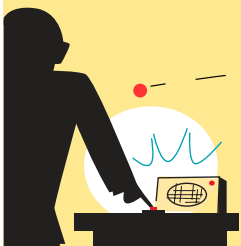
PLANT HEROES



He also brings the bark depressions and dime-sized exit holes of the Asian longhorned beetle to the attention of his troop. They quickly return the firewood to his friend's yard and contact the county extension office.



The Plant Heroes team is notified and sent in to help Frankie inspect the trees in the area and deploy pheromone traps in the affected neighborhood. They find a dozen infested trees and remove them before the Asian longhorned beetle spreads even further!



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The Starry Sky Beetle

The Asian longhorned beetle is also called the “starry sky beetle.” Looking at the photo of the beetle below, can you guess why scientists decided to give the beetle these two names? Is there anything about the way the beetle looks that gives you a hint?

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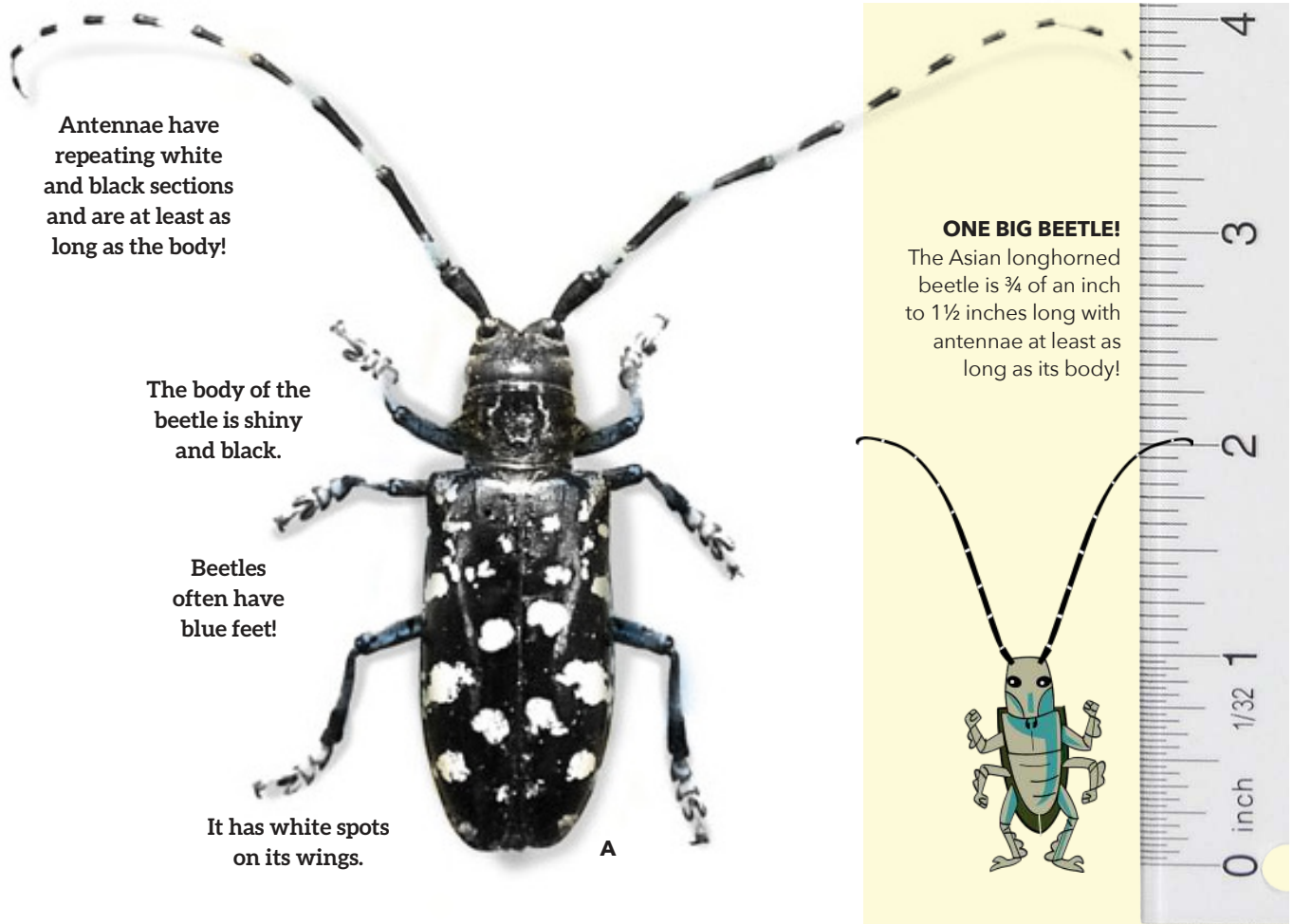
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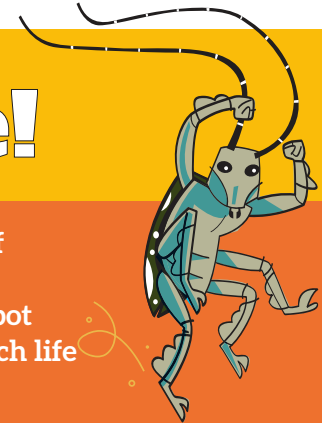
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Metamorphosis Time!



The Asian longhorned beetle has four different life stages and the process of the beetle changing during these stages is called “metamorphosis.” Read the descriptions below to learn how entomologists (people who study insects) spot these life stages and see if you can match the photograph of the beetle in each life stage to its description!

1



2



3



4



LARVA

An Asian longhorned beetle larvae is over one inch long and is cream colored. Larvae chew tunnels deep in the tree, preventing the tree from moving water through its trunk and making the tree very weak.

.....

ADULT

The adult beetle has very long antennae—as long as its body or longer. It is black with white spots. When adults chew their way out of a tree, they leave large round holes.

.....

EGG

The adult female beetle lays eggs on the bark of trees. One egg is about the size and shape of a grain of rice.

.....

PUPA

During the pupal stage, the Asian longhorned beetle rests inside the tree while slowly changing into an adult.

HANDY TIP!

Add an “e” at the end of larva or pupa if you are talking about more than one larva or pupa!



Meet The Trees!

Asian longhorned beetles burrow through many different trees. These trees are called “hosts” because the beetles are the “guests” that feed on them. Below are some of the host trees that Asian longhorned beetles live in. Search in a garden or park near you and see if you can find any of the leaves of these host trees (check the hints and your field guide host pages for help). Draw or describe what each leaf looks like.



RED MAPLE

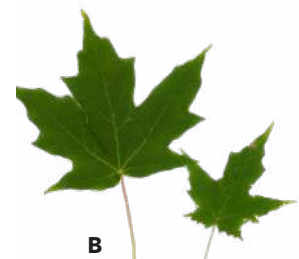
Hint: This tree has red twigs, red seeds, red flowers, and red fall leaves. The leaves are dark green the rest of the year. It produces “helicopter” seeds—two-winged seeds that twirl if you drop them.



A

SUGAR MAPLE

Hint: The leaves on this tree look almost like a hand with 3-5 finger shapes called “lobes” with points on the end. It also has “helicopter” seeds. Maple syrup comes from sugar maple trees!



B



plantheroes.org

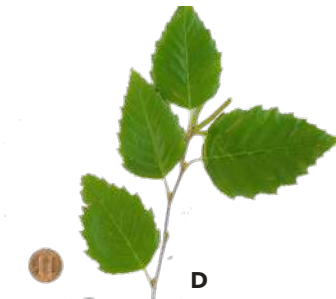
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SYCAMORE

Hint: This tall tree has bark that looks like a camouflage pattern with white and gray patches. It often grows in wet areas and the fruit is a ball that hangs on a stem. Although the leaves may look like a sugar maple, they are much thicker and more leathery feeling.



BIRCH

Hint: This tree often has bark that looks like paper and peels off in strips! Birch trees are tall and skinny with more than one trunk coming out of the ground. The leaves are diamond or triangular shaped with many sharp points called “teeth.”



WILLOW

Hint: A common type of willow is a weeping willow which has drooping branches and yellow stems. You can find willows near ponds or streams, and they will have very skinny long leaves with a pointed tip.

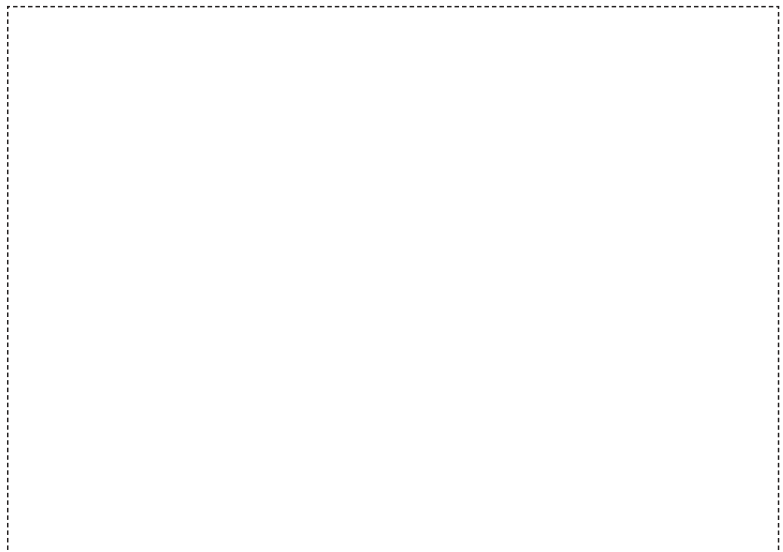


PHOTO CREDITS: C: Katja Schulz; D, E: Maggie, Flickr.com



Trees in Trouble



When the Asian longhorned beetle eats parts of trees, it causes injuries called “symptoms.” If you find a tree with an Asian longhorned beetle infestation, you may be able to spot the symptoms below. Using what you know about the lifecycle of the beetle, number the symptoms in the order which they happen. The first has been completed for you.

1

Female Asian longhorned beetles lay their eggs in grooves they have chewed into the bark of a host tree.



The tree starts to show signs that it is not getting enough water. For example, its leaves turn yellow. Because of the tunnels inside the tree, it becomes very weak and unstable.

Round exit holes in the bark of the tree are caused by adult beetles chewing their way out of the tree.



Frass, (beetle waste), which looks like sawdust, comes from larvae tunneling inside the tree. As the beetles continue to tunnel, more and more frass is moved outside the tree.



Larvae hatch and then chew through the bark of the tree creating tunnels called “galleries.” These tunnels can cut off the tree’s supply of water and can make the tree very unstable.

For more information on symptoms caused by the beetle, see this video, or scan the QR code with your phone. bit.ly/asianlonghornedbeetle



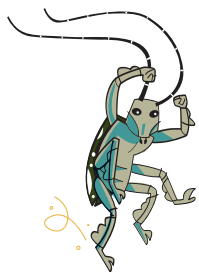
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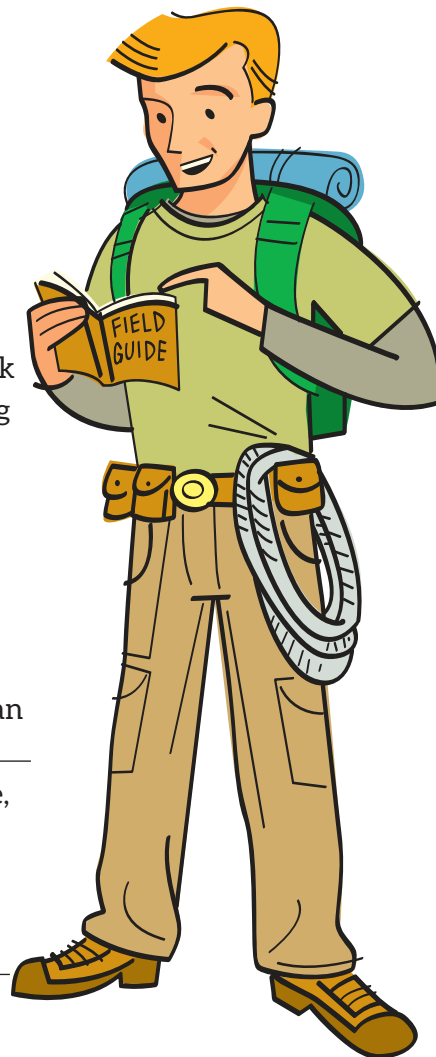
PHOTO CREDITS: A: Mollie Freilicher, Flickr.com; B: Dennis Haugen, Bugwood.org; C: US Dept of Ag, Flickr.com; D: Steven Katovich, Bugwood.org; E: Kenneth R. Law, Bugwood.org

Slow the Spread!

Frankie is an Asian longhorned beetle expert, and he knows all the right ways to stop the beetle from spreading. Fill in the blanks below to learn Frankie's tips and tricks!



WORD BANK:
MOVE, ROUND EXIT HOLES,
YELLOW LEAVES, SYMPTOMS,
FIREWOOD, HOSTS, TUNNELS



1. Do you like camping? I do! When you go camping, make sure you pick up your _____ at the campground, rather than bringing it from somewhere else.
2. If you live in one of the states that has an Asian longhorned beetle population like I do, make sure you only plant trees that are not _____ for Asian longhorned beetles!
3. If you see a tree showing _____ of injuries from Asian longhorned beetles, such as _____, _____, and _____ ask an adult to contact an expert for advice, such as your local extension officer.
4. The Plant Heroes and I love planting trees. Make sure you buy your trees from nurseries near your house, and do not _____ any plants, plant parts, or woodchips long distances.

ANSWER KEY

Metamorphosis Mania: 1. Egg, 2. Larva, 3. Pupa, 4. Adult

Trees in Trouble: 1: a; 2: d; 3: e; 4: c; 5: b

Stop the Spread!: 1. firewood; 2. hosts; 3. symptoms, yellow leaves, round exit holes, tunnels; 4. move





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 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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This publication was developed with financial support from the US Forest Service and the USDA Animal and Plant Health Inspection Service.

