WE NEED YOUR HELP!

We are glad to provide these materials for free. In order for us to continue receiving funding for new materials, we need to collect information on how they are used. Thank you for taking the time to answer the following one-minute survey.

There are three ways to complete the survey:

1) Scan this code with your smartphone camera

2) Type the following link into your web browser:
   https://plantheroes.org/educator-survey

3) Email your answers to:
   plantheroes@publicgardens.org

1) Job title
2) Name of organization you belong to
3) What kind of educator are you?
   - Teacher
   - Summer camp counselor
   - Home schooler
   - Public garden educator
   - Informal educator
   - Other (please describe)
4) What grade level do you teach?
   - Elementary (K–5)
   - Middle School (6–8)
   - High School (9–12)
   - Other (please describe)
5) Specify what subject area you teach:
   - Science
   - Math
   - Language Arts
   - Social Studies
   - Other (please describe)
6) How many students do you teach in a school year?
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!
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 backyard. 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.

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

USE FIREWOOD WHERE YOU FIND IT. STOP ASIAN LONGHORNED BEETLE FROM TRAVELLING!
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!
Complete the Asian longhorned beetle crossword puzzle. Look on the next page for word clues!
PLANT HEROES

DOWN

1 The hard, central part of the trunk of a tree, consisting of the old and matured wood, and usually differing in color from the outer layers. Asian longhorned beetle weakens this, making infested limbs likely to break off.
2 A type of insect that spends all or part of its life tunneling into the wood of trees
3 To eliminate completely; get rid of. Hopefully, we can ___ Asian longhorned beetle in the United States!
6 The study of insects.
7 A plant’s woody tissue that provides support and carries water and mineral salts. This layer is damaged when Asian longhorned beetle larvae feed within the tree.
9 The tail end of an insect’s body; the part just behind the thorax.

ACROSS

4 Debris or excrement produced by insects. Asian longhorned beetle larvae produce ___ that collects around the base of infested trees and looks like thin sawdust shavings.
5 Wood used for fuel. Asian longhorned beetle can very easily be transported this way, so you should never move it!
8 The immature form of an insect.
10 The middle section of an insect’s body where its wings and legs are attached.
11 A chemical signal released by an insect or other animal that affects other members of its species, causing their body processes or behavior to change. These chemicals are used in Asian longhorned beetle traps to attract adult beetles.
12 Tunnels that adults or larvae of wood boring insects like Asian longhorned beetle create when burrowing in the tree’s wood.

Asian longhorned beetles are easy to recognize!

If you see a large, shiny black beetle with white spots like this one, be sure to report it at asianlonghornedbeetle.com.

Joe Boggs, Ohio State University, Bugwood.org

5476349

PLANT HEROES

GAMES!
Learn more and test your knowledge with interactive games on plantheroes.org

plantheroes.org
© 2015 American Public Gardens Association
Complete the maze, and then find the words. The words can only be found along your maze path.

Find and circle these words:

**THORAX**   **INSECT**   **MAPLE**
**XYLEM**   **FRASS**   **LARVAE**
**EGG**   **BIRCH**   **FIREWOOD**
**LEAVES**   **ASH**   **PUPA**
**WILLOW**   **BEETLE**   **ABDOMEN**
**ELM**   **ENTOMOLOGY**   **ADULT**

---

Check out PLANTHEROES.org for more games and activities!
<table>
<thead>
<tr>
<th>THORAX</th>
<th>EGG</th>
<th>ADULT</th>
<th>LARVAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSECT</td>
<td>EG</td>
<td>FRASS</td>
<td>PUPA</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>GENUS</td>
<td>SPREAD</td>
</tr>
</tbody>
</table>

| G E S O G G | E G G |
| M O A P U P A J V |
| A S P R E A D N W |
| G N G E N U S O S S |
| N F R A S S Y R S |
| G X S I N S E C T |
| D L A R V A E A E |
| A D U L T D T A G |
| U R T H O R A X H |
Oh, no! The letters from twelve words have been curved and hidden in the puzzle. A curved word may start anywhere in the puzzle. It can then move in any direction. Once a word has used a square in the puzzle, that word may not re-use the same square. But another word is allowed to re-use squares from other words. One word has already been found for you!

Find each of the following words.

LEAVES
WILLOW
BEETLE
ELM

MAPLE
FIREWOOD
XYLEM
FRASS

ASH
INSECT
BIRCH
ENTOMOLOGY
Complete the Plant Heroes word search!
TO MAKE IT FUN, "INSECT" IS SPELLED BACKWARDS!

E E E D B B S R A G L A R V E
U E L O S P D G A R R P U F R
E H P T F R A S T U R E E B
V A N A S I E B O R E R S A A
R A V A N L A H P U P A A R A
R B D R U E A V R A L P X A E
A E O D T C E S N I E A A D S
I N A R A S U A A E R R E C P
E T P R O N P R O O F O U T F
N S T P E O S R H O E T E G L
N A L G G F G T E O P A N C A
E C U D G N A D H A T R E G V
G R D F O C I T F R D R S A S
A R A S L G S P R E A E N G U
V E R A L A E A T T R D I S I

THORAX  BORER  SPREAD  ADULT  PUPA
EGG       GENUS   LARVAE  FRASS  INSECT

GAMES!
Learn more and test your knowledge with interactive games on plantheros.org
© 2015 American Public Gardens Association
Plant Heroes Pledge

This Certifies That is an Official Member of the Plant Heroes Team and pledges to:

- Awarded by the American Public Gardens Association
- Learn about the pests and diseases that affect the plants in my region
- Be on the lookout for symptoms of pests and diseases on trees in my neighborhood
- Report any suspicious findings to an adult who can notify the local extension agent
- Refrain from moving firewood
- Refrains from moving firewood
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.