

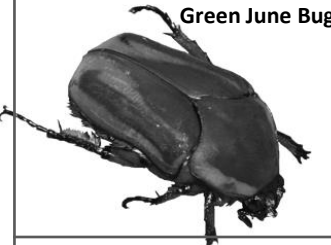



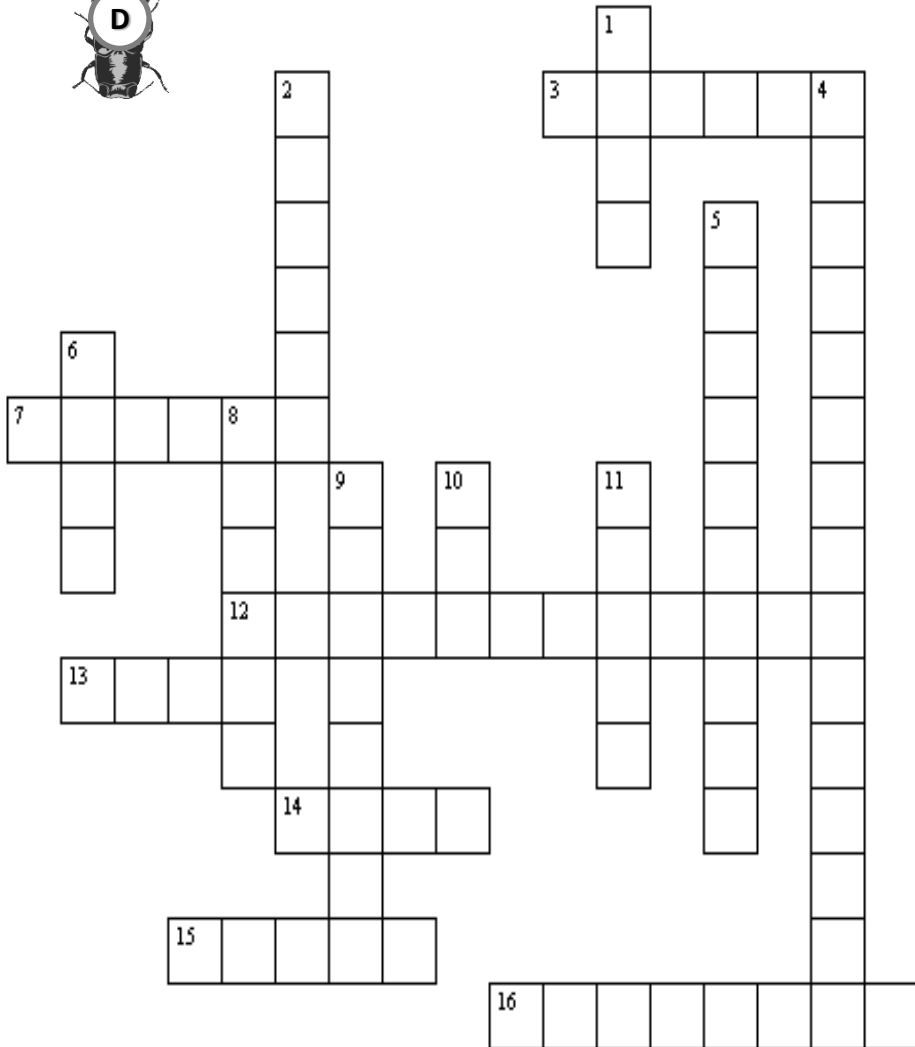
Not every green beetle out there is an EAB! Some native insects are often mistaken for EAB. Here are a few of them. Fill out this chart to compare and contrast these native 'lookalikes' to the real invasive pest!



Insect	Shiny?	Size	Body Color	Body Shape	Eats Ash Trees?
Emerald Ash Borer	Yes	½ Inch	Green	Long	Yes
Six Spotted Tiger Beetle 			Green		No, it is a predator
Dogbane Beetle 			Green		Eats dogbane leaves
Green June Bug 			Green		Eats tree leaves
Japanese Beetle 			Brown and Green		Eats garden plants



EAB CROSSWORD PUZZLE



ASH TREE MATH

Since EAB invaded North America, a staggering number of ash trees have died. Millions of ash trees in the Midwest alone have fallen victim to the EAB. Here's a math problem you can solve that will help you visualize how much impact EAB could have on Connecticut:

It is estimated that ash trees make up 5% of all the total trees in Connecticut. That may not seem like a lot, but it can add up!

If 5% of 100 trees is 5 trees, and 5% of 1000 trees is 50 trees, what is 5% of 10 million?

There are an estimated 22 million ash trees in Connecticut. If 5% of Connecticut's trees are ash, then how many total trees are there in Connecticut?



Ash Trees are an important part of our native forests. They provide **shade** and homes for animals, and they provide a sturdy wood that is used to make many different things, like baseball bats. Ashes have **opposite** branches, like your arms. Their leaves are **compound**, so a single leaf looks like 5 to 7 smaller leaves put together. The seeds are sometimes called **samaras**. Here is the leaf and seeds of the green ash, our most common ash species. See if you can find any of these trees in your own backyard!



DOWN

1. Young EAB live under this part of the tree.
2. EAB is this type of six-legged animal.
4. What the acronym "EAB" stands for!
5. A place to pitch a tent or park an RV.
6. Never bring firewood with you from here.
8. The time of year when young EABs feed in the tree.
9. EAB could be moved to new places in this.
10. The only type of tree that EAB eats.
11. What EAB eventually does to trees.

ACROSS

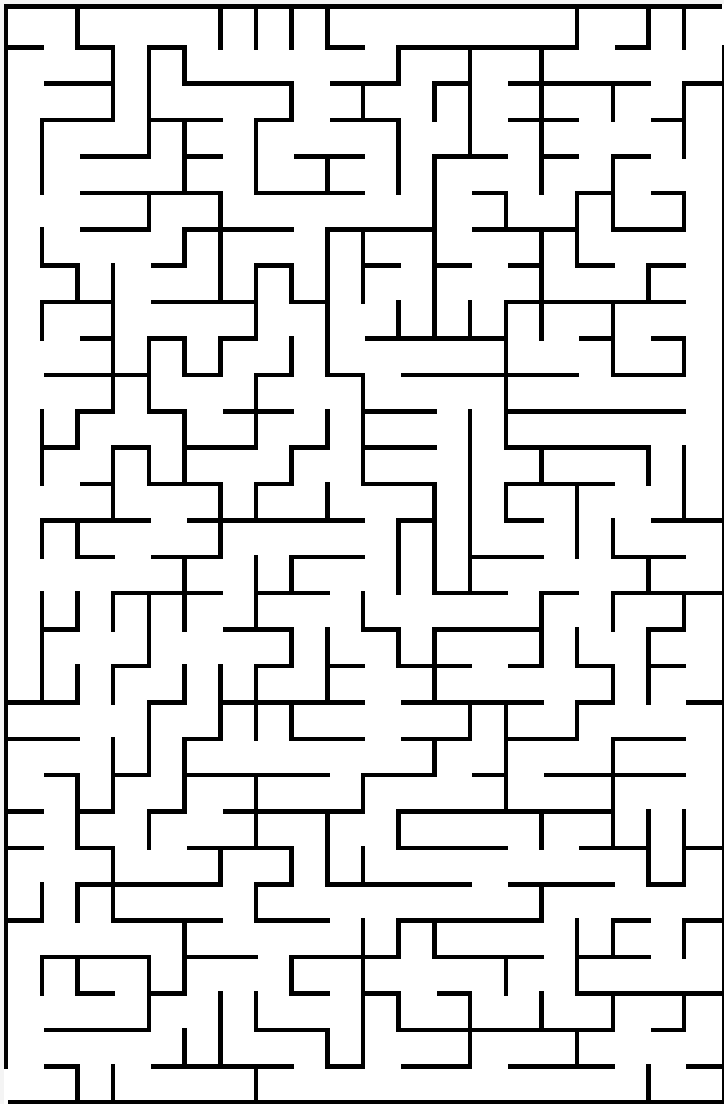
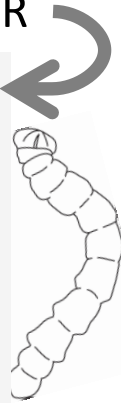
3. The proper term for young EABs.
7. A lovely place full of trees and animals.
12. A gooey treat that you toast over flames when camping.
13. What some states charge if you move firewood illegally.
14. How you will feel if you help save Connecticut's ash trees!
15. Trees provide this on a sunny day.
16. Make sure you use local firewood when you make one of these!



EAB larvae create serpentine tunnels under the bark of host trees. Follow this EAB larva on its path to becoming a pupa:



ENTER



EXIT

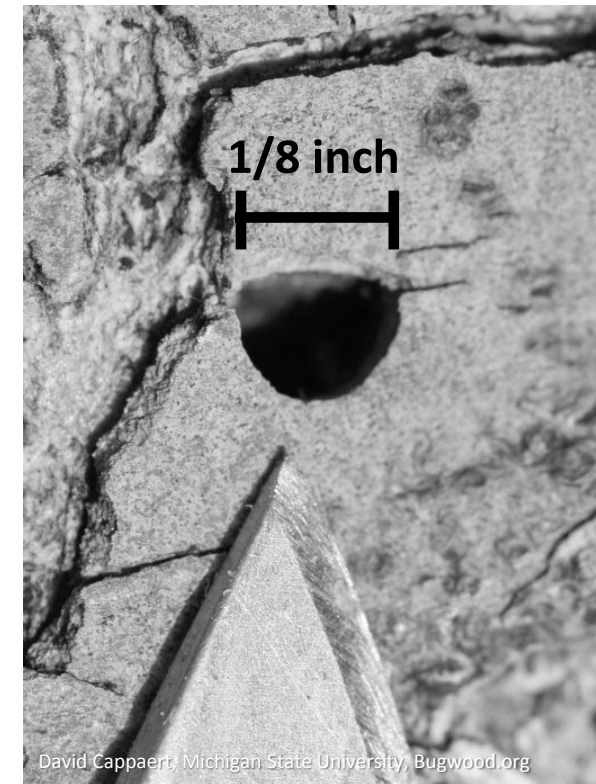
EAB DAMAGE - EXTERNAL

Some of the damage EAB causes can be seen on the outside of the tree:

D-shaped exit holes, made by EAB adults coming out of the tree. The holes are about 1/8 of an inch in diameter.

Why do you think EAB exit holes are shaped this way and aren't round?

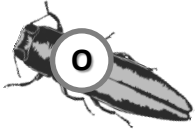
Hint: EAB adults are D-shaped in cross section.



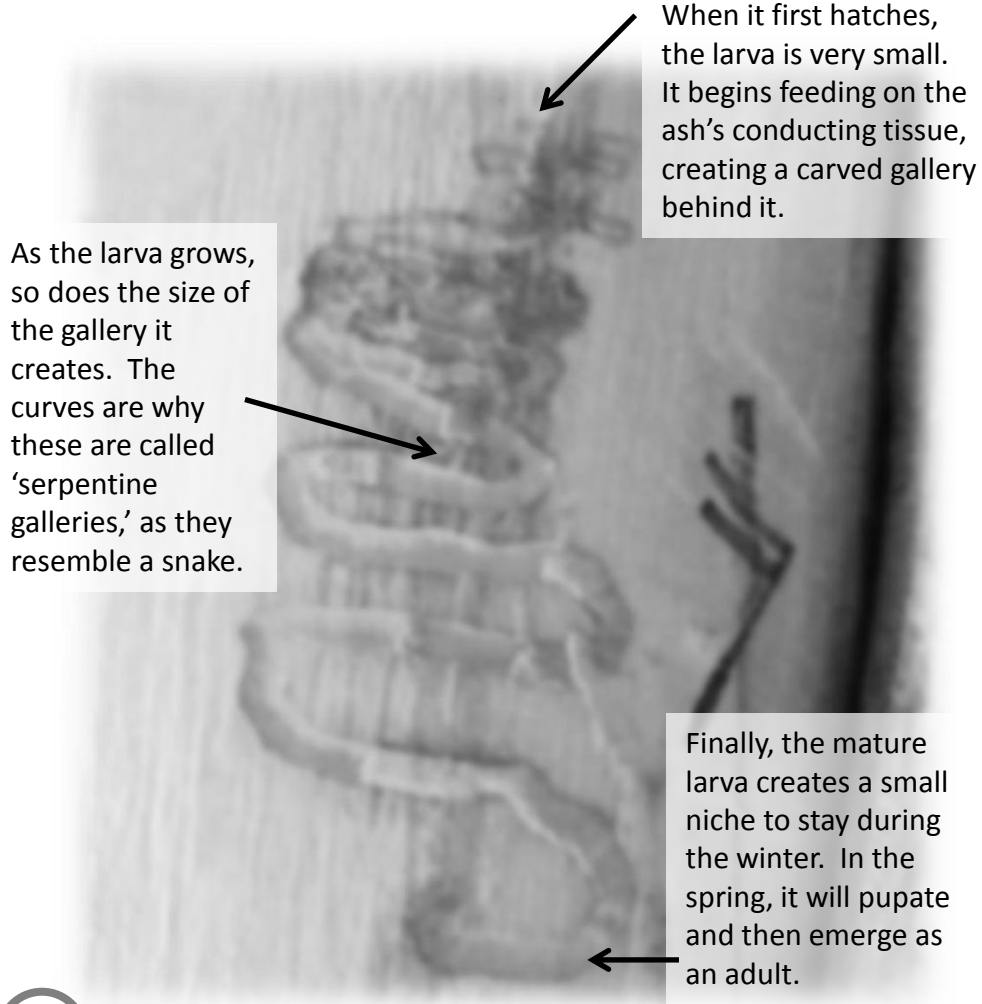
What stage of EAB do you think causes the most damage, and why?



EAB DAMAGE - INTERNAL



EAB larvae are incredibly destructive, but most of the damage they cause happens on the inside of the tree, where we can't normally see it. This diagram shows what is going on underneath the bark when an EAB larva grows and feeds.



FIREWOOD AND EAB



EAB spends most of its life as a larva inside the wood of the tree. In some states it is illegal to transport firewood from out of state and you may have to pay a **fine** if you do. These two facts are related!

Bringing firewood from far away means bringing along any pests that might be inside that firewood to your destination!

This is one way that we can slow the spread of invasive pests such as EAB.

These pieces of wood have been infested by EAB. You can even see the serpentine galleries that the EAB larvae have created!



Which places do you think are most at risk for EAB and other invasive pests from firewood? HINT: Where do people use lots of firewood?

CRACK THE CODE!

Each page of this booklet has an EAB with a letter, like this:



Find them all and write them down here, then use them to reveal the messages on the following page:

- Page 1: _____
- Page 2: _____
- Page 3: _____
- Page 4: _____
- Page 5: _____
- Page 6: _____
- Page 7: _____
- Page 8: _____
- Page 9: _____
- Page 10: _____
- Page 11: _____
- Page 12: _____
- Page 13: _____
- Page 14: _____
- Page 15: **M**
- Page 16: _____
- Page 17: _____
- Page 18: _____

EAB WORD SCRAMBLE!

Each of these, when unscrambled, will give you a word related to EAB.

ETLEBE

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SHA

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ENREG

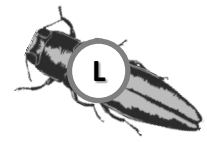
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ORWOIFE

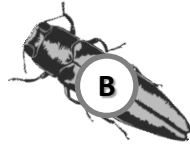
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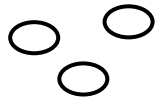


EAB LIFE CYCLE

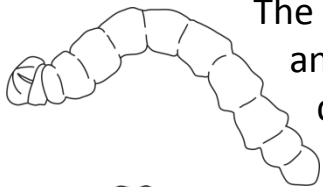


As it grows, an emerald ash borer undergoes a process called '**complete metamorphosis**,' just like butterflies.

There are 4 **stages**:



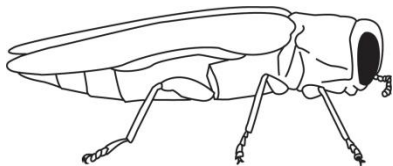
EGGS are laid by adult beetles in the summer. They are round and flat. They hatch about 2 weeks later.



The **LARVA** feeds on trees in the summer and fall, and will hibernate inside the tree during the winter.



The **PUPA** develops inside the tree during early spring.



ADULTS are active in the late spring through the summer.

3

What other insects can you think of that go through complete metamorphosis?

Using the code on the preceding page, discover 3 important messages:

$$\begin{array}{r} \overline{9} \quad \overline{6} \quad \overline{3} \quad \overline{9} \quad \overline{6} \quad \overline{8} \quad \overline{1} \\ \overline{8} \quad \overline{2} \quad \overline{9} \quad \overline{9} \quad \overline{1} \end{array} !$$

$$\begin{array}{r} \overline{11} \quad \overline{5} \quad \overline{14} \quad \overline{8} \quad \overline{15} \quad \overline{5} \quad \overline{17} \quad \overline{9} \\ \overline{13} \quad \overline{12} \quad \overline{2} \quad \overline{9} \quad \overline{10} \quad \overline{5} \quad \overline{16} \quad \overline{11} \end{array} !$$

$$\overline{2} \quad \overline{9} \quad \overline{7} \quad \overline{16} \quad \overline{2} \quad \overline{8} \quad \overline{9} \quad \overline{6} \quad \overline{3} !$$



16

PURPLE TRAPS

You may at some point have seen a funny-looking triangular purple box hanging in a tree near a roadside or campground.

These are traps for catching EAB!

The trap is sticky. It is **baited** with a specific scent that mimics the smell of a stressed ash tree – a smell that EAB are attracted to. When the EAB lands on the trap, it gets stuck.

The traps are checked for EAB every couple of weeks.

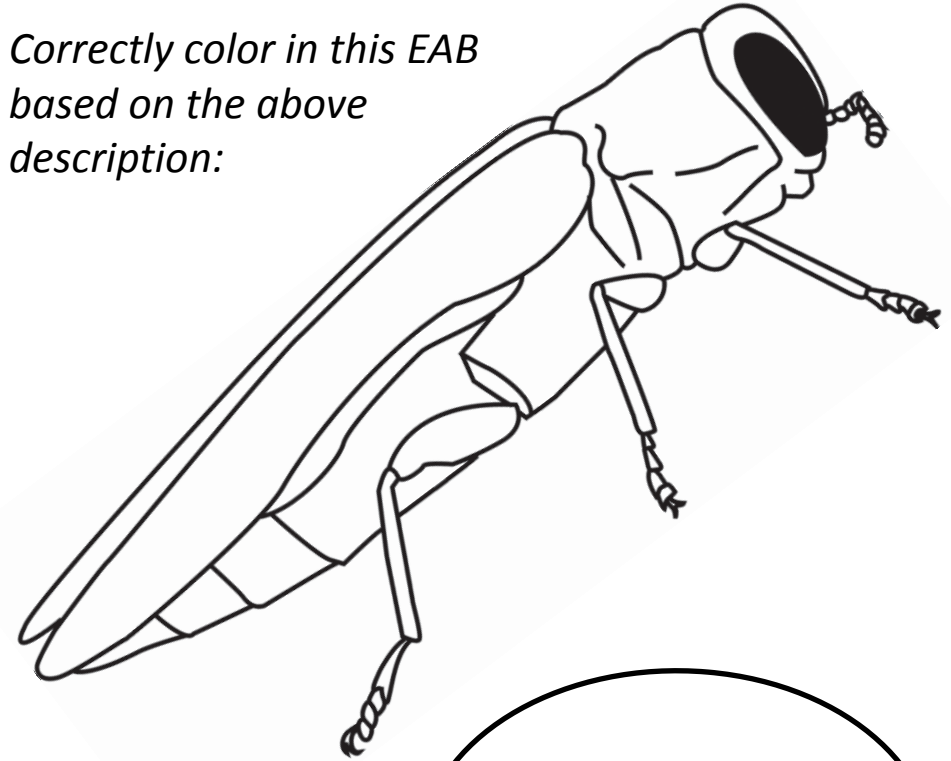
Next time you are on a car ride, see how many traps you see!



MEET THE EAB

The emerald ash borer is a **bright, shiny metallic green** in body color. Its **abdomen is reddish**. It is small, only ½ inch in length.

Correctly color in this EAB based on the above description:



Try looking at a picture of an EAB for reference!

INTRODUCTION

Not all alien invaders are from another planet! The **emerald ash borer** (EAB) arrived in North America as larvae in wooden pallets or crates from **Asia**. This beetle only eats **ash** trees. When EAB attacks an ash tree, it will eventually lead to the tree's death.

EAB is an **invasive** species, which means it causes damage to the **native** environment - the trees and animals that already live there.

EAB was first found in North America in 2002 when it was discovered in Detroit, Michigan. It has since spread to 19 other states and is responsible for the deaths of millions of ash trees in the Midwestern United States. Although the beetle can disperse naturally, it is spread mostly readily as larvae in infested ash logs used as firewood.

EAB was first discovered in Connecticut in July of 2012. It is clearer than ever that public awareness is the most important weapon in the fight to slow the spread of EAB. Limiting the movement of infested firewood drastically decreases the rate at which EAB spreads, and when this insect is discovered early, the damage and loss of ash trees can be minimized.

By completing this activity book, you will learn how to recognize emerald ash borer, its damage, and why preventing the movement of firewood can slow the spread of this this invasive pest.



BIOSURVEILLANCE

Scientists can actually use the behavior of other animals in the environment to find invasive species! This is called **biosurveillance**.

For example, the solitary ground-nesting wasp *Cerceris fumipennis* is used to monitor for EAB. This small non-stinging wasp hunts for only beetles belonging to the family Buprestidae. EAB is a Buprestid beetle!

Scientists can catch the wasps on their way back from beetle hunting trips. They will then identify the beetles taken from the wasps to see if it is an EAB.



EEK!!!



If you think you've seen this invasive pest in Connecticut, call

The Connecticut Agricultural Experiment Station:

(203) 974-8474

Or email **CAES.StateEntomologist@ct.gov**

For anywhere else in New England:

(866) 702-9938

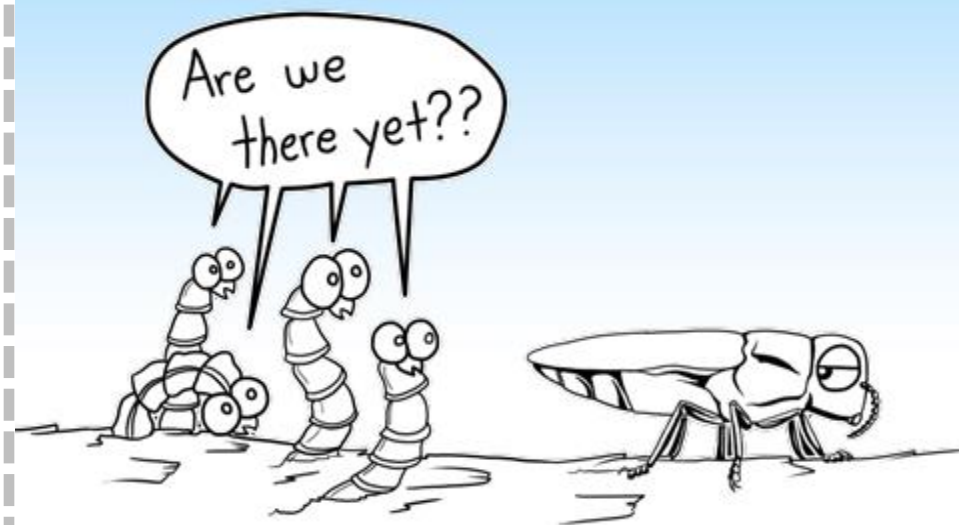
For more information on Emerald Ash Borer, visit:

www.emeraldashborer.info

PURDUE
UNIVERSITY

This booklet was adapted from a Purdue University Entomology Department publication.

THE EMERALD ASH BORER ACTIVITY BOOK



Learn all about this
invasive alien invader!