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PRESENTS

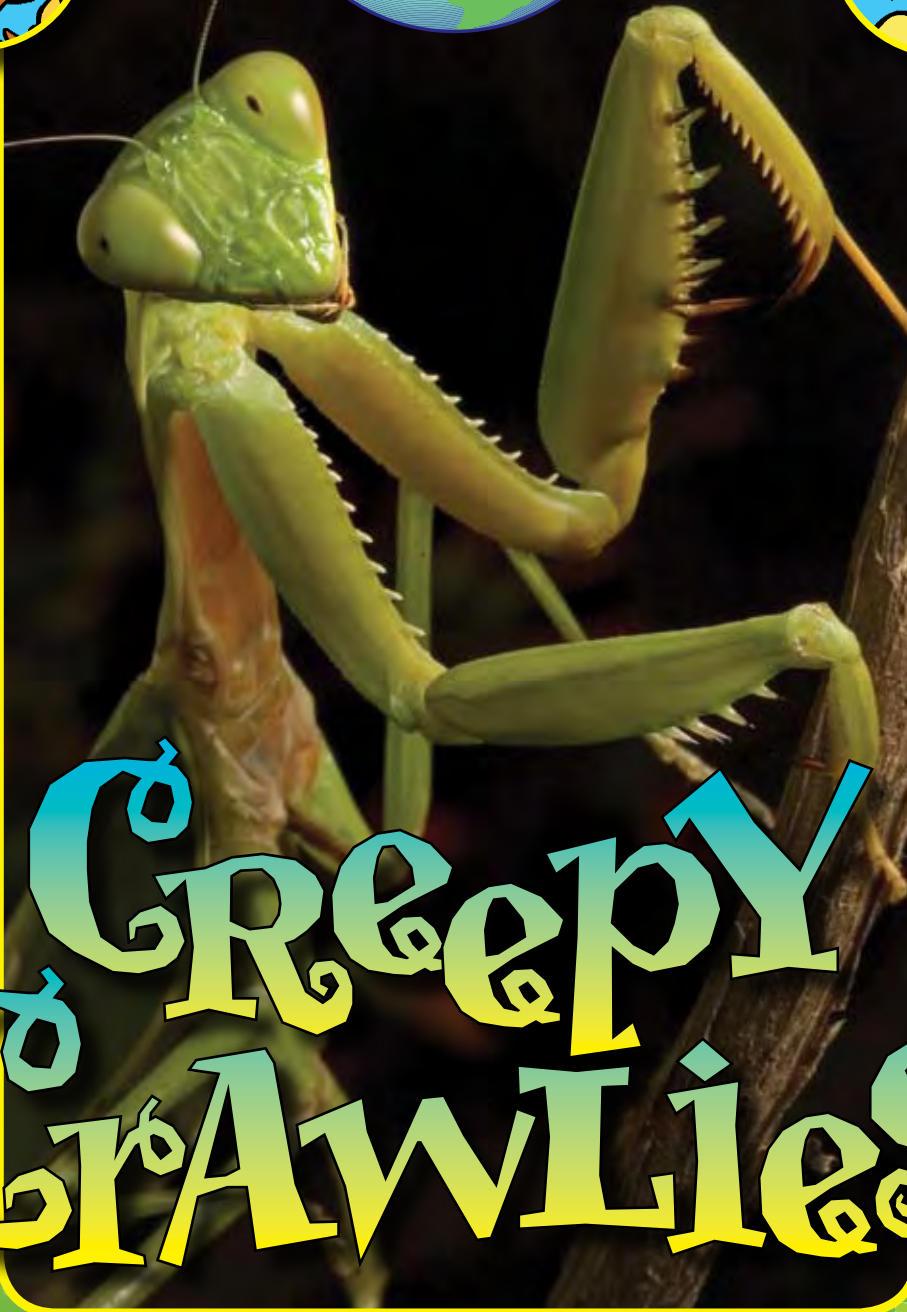
THE LOUISVILLE ZOO
BACKYARD

ACTION HERO

2007

GUIDEBOOK

2008



Creepy Crawlies

Lots of Fun Facts! Cool Activities! Awesome Animals!

Welcome Future Heroes

We are so glad that you are interested in learning what it takes to be a Backyard Action Hero! At Toyota Motor Manufacturing, Kentucky, Inc. (TMMK), we believe that protecting the environment is part of our mission to be a Good Neighbor across Kentucky. As we build cars in our plant in Georgetown, we are committed to protecting the environment, obeying the environmental laws, preventing pollution and continuously improving our process. But the commitment does not stop there. It is everyone's responsibility to protect the environment.

Becoming a Backyard Action Hero is the first step in learning how we all co-exist with the plants and animals that make up our environment. Once you have finished this book, you will be ready to accept your mission to take action in your neighborhood, your school or even your own backyard!

**Sincerely,
Your Friends at Toyota Motor Manufacturing, Kentucky, Inc.**



Viceroy butterflies

WHAT IS A BACKYARD ACTION HERO?

A Backyard Action Hero – or BAH as they are called – is a kid who is really into wildlife and habitats and is ready to take action to protect them. They think being “green” is cool, and they know that to really make a difference you not only need to learn, but you also need to act! BAHs care about animals and habitats in their own backyards as well as all around the world. Since the Louisville Zoo is a great place to learn about all kinds of plants and animals, our BAH crew will check out what's going on there and introduce some of the Zoo's real life conservation heroes!



MEET THE BAH CREW

Four Backyard Action Heroes will lead you through this book as you prepare to become a BAH yourself! Wade knows a lot about water and Skye is an expert on air. Tanya is really into making things grow and Alden is all about animals. They all think being green is cool and they're all ready to help you take action to help the planet!

DID YOU KNOW...

The Louisville Zoo is one of only 200 zoos that are accredited by the Association of Zoos and Aquariums (AZA). The AZA is an important group that ensures animals get great care and visitors have great experiences at its zoos.

Hello Again Backyard Action Heroes

If you have been keeping up with our Backyard Action Heroes publications, then you know the purpose of this booklet is to help kids find out more about what they can do to help with conservation efforts in their neighborhoods, communities, schools or right in their own backyards. In last year's BAH book we looked at deciduous forest ecosystems like those found in Kentucky. (You can download a copy of that book at www.louisvillezoo.org/BAH.) This time we are going to look at animals that some people refer to as "Creepy Crawlies."

When you hear the term "Creepy Crawlies," what kinds of creatures come to mind?

Most people immediately think of things like insects, spiders, toads and snakes. These animals have gotten a "creepy" reputation for a wide variety of reasons, but if you take a little time to understand them, these creatures are actually quite interesting. Not to mention they are often very helpful to have around.



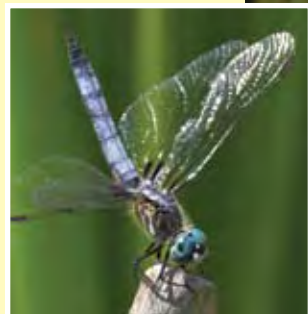
Top, Aldabra giant tortoise
Above, yellow dragonfly
Left, green iguana



Insects & Arachnids

Lots of people view insects and arachnids as things to be swatted or stomped. Both are considered to be pests in some cases, but you may be amazed at how beneficial some of these creepy crawlies can be.

Did you know that more than 95 percent of all animal species are insects?



Clockwise starting at top left, a fly, detail of the face of a praying mantis, a blue dragonfly and a mosquito.

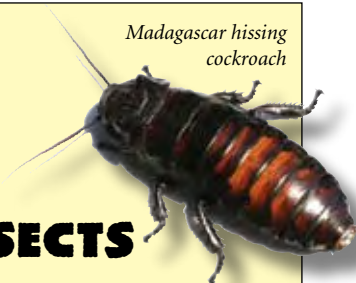
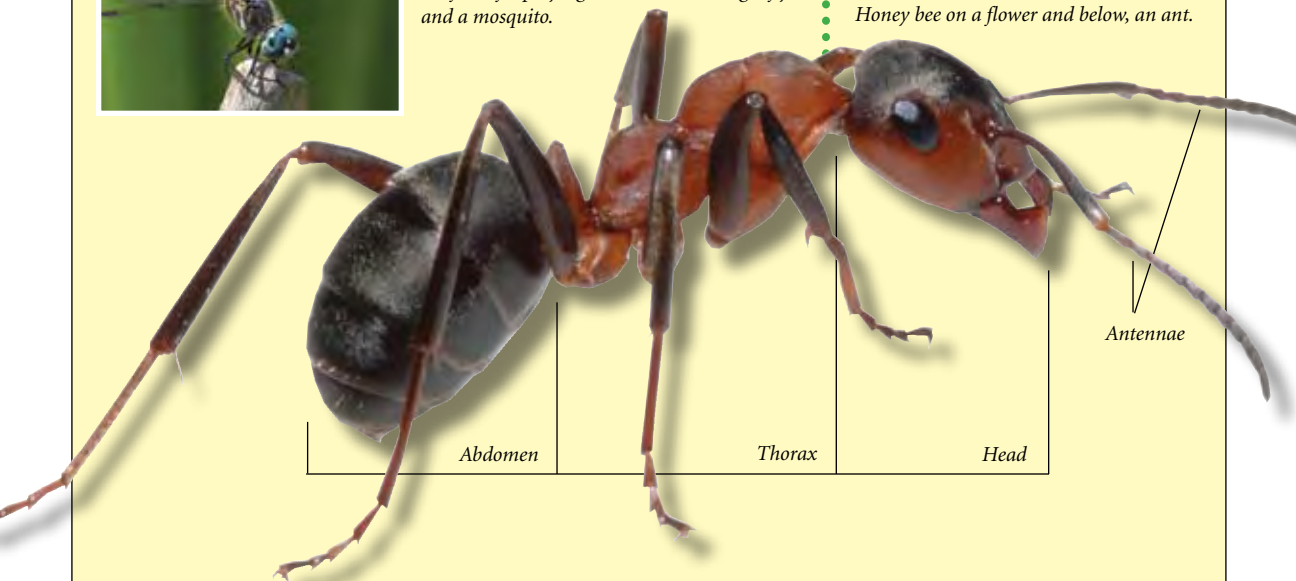
INSECTS

Insects are the largest group of animals on the planet. In fact, more than a million species of insects have been discovered and scientists believe there could be 5 or 10 times that yet to be discovered. There are four things that all insects must have: a body with three parts (head, thorax and abdomen), six legs that are jointed, two antennae and an external skeleton (exoskeleton).

Insects are extremely beneficial creatures. They are essential for pollination of plants, including the crops we grow, and they themselves are food sources for many animals in most every ecosystem on the planet. But don't take my word for it, here's what Zoo Keeper Dave Hodge has to say:



Honey bee on a flower and below, an ant.



Madagascar hissing cockroach

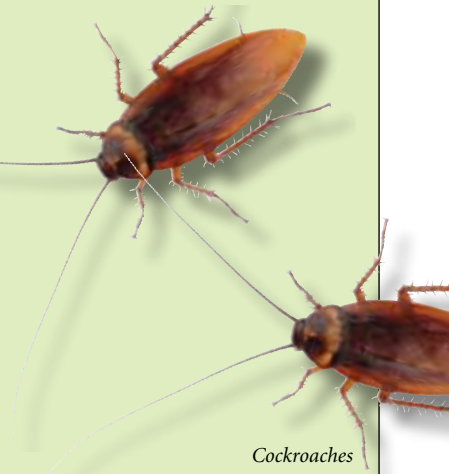
Insects are the tiny creatures that move the world. They crawl, fly, and swim. They originated before the dinosaurs. They have no backbone, but they do have a hard outer shell called an exoskeleton. They all have six legs, three body segments, and antenna when they are adults.

Some, like butterflies, look very different in their larval (immature) form, while others look the same all their life. Some are social species such as ants, bees and wasps. Others, like the praying mantis and dragonfly, live alone.

While some insects are pests like mosquitoes and cockroaches, many are beneficial like silkworms and honey bees.

As you can see, insects are numerous. They comprise the largest amount of the earth's biomass. Much of the earth's vegetation depends on insects for pollination, and we depend on the vegetation to help us live. The ground itself is turned over many times by the billions upon billions of ants that live around us. Insects are vital to the survival of life. They are the tiny creatures that move the world.

DAVE HODGE



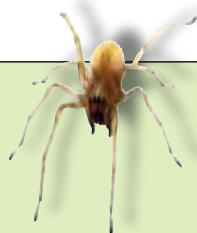
Cockroaches



Above, brown daddy long legs. Left, Dave Hodge with Madagascar hissing cockroaches

Photo by Kara Bussabarger





Insects & Arachnids *Continued*

Scorpion

Think about this - all spiders are arachnids but not all arachnids are spiders.



ARACHNIDS

Some people think arachnid is just another name for spiders. Actually it means much more! Arachnids also include scorpions, daddy longlegs, mites, ticks and certain invertebrates. The easiest way to identify an arachnid is to look at the body and legs. These animals have eight legs and their bodies are divided into two distinct parts: anterior (front) and posterior (back). There are about 60,000 known species of arachnids but scientists tell us that many species are yet to be discovered.



At first glance arachnids may not seem to be as helpful as insects. Some spiders and scorpions are poisonous, while ticks and mites are parasites that can cause the spread of disease. However, most arachnids are fairly harmless and play their part in the web of life primarily by helping to control populations of insects they prey upon. Zoo Keeper Sam Clites works with arachnids at the Louisville Zoo and has something to say about spiders in particular.

Left, a golden garden spider and above, orb weaver spider



Spiders are found all around us, although most people never notice them. These amazing little predators do a job that is very important to our ecosystem. They control the population of insects! Orb weavers like the Golden garden spider catch numerous flying and biting insects in the webs they build. Small spiders that may live around our homes actually prevent some insects from entering to annoy, scare or even "gross out" the humans inside. Spiders, as the old saying goes, are "more afraid of us than we are of them." They are, for the most part, secretive animals that see us as the predator. Spiders don't go looking for humans, and we really have nothing to fear from them. We should be thankful that they are here to help keep the balance in the "web" of life.

SAM CLITES



Sam Clites with a Chilean rose hair tarantula

Photo by Kara Bussabarger



Lab Project #1:

BACKYARD INVENTORY

Materials:

12.5 feet of string
4 stakes (sturdy sticks or dowel rods will work)
paper and pencil

Prepare Your Site:

Select a 3-foot square area of your yard. Use the stakes and string to mark the area.

Hypothesize:

1. What you think you will find in your backyard inventory?
2. Do you think the time of day will affect what you find?
3. Do you think weather conditions will affect what you find?

Investigate:

1. Carefully study the area.
2. On your paper write a list of everything you see in your square. Include plants and animals. Make notes of anything interesting that may be going on (like ants building an anthill). Be sure to include the date, time of day and weather conditions.

3. Repeat this process two to three times a week for a month. You may continue for even longer if you wish. Try to visit your square a few times in the morning and a few times in the evening or at night. Also try to visit during different weather conditions.

Analyze and Summarize:

1. How did the list of what you thought you would find compare to what you actually found in your inventory?
2. Was the list the same or similar each time you visited in the morning?
3. Was the list the same or similar each time you visited at night?
4. How did the day list differ from the night list?
5. What effects did the weather seem to have on your inventory?

Here's a handy chart that lists some of the similarities and differences between arachnids and insects.

INSECTS

- 3 main body parts
- 6 legs
- compound eyes and chewing jaws
- Most insects can fly
- Have antennae with which to smell

ARACHNIDS

- 2 main body parts
- 8 legs
- simple eyes and piercing jaws with fangs
- Cannot fly
- All spiders have fangs and most have poison glands (but only some are harmful to humans!)



Amphibians & Reptiles

Two other groups of animals that get a bad reputation are reptiles and amphibians. A snake slithering through your yard may send chills up your spine, but reptiles and amphibians are fascinating animals. Read on to learn more!

Did you know that the hellbender is one of the largest amphibians in the world? You may have to look closely, but you can see a hellbender in the HerpAquarium at the Louisville Zoo.



Top, a hellbender, above a salamander (left) and a red-spotted newt (right). Left tomato frogs and below, an Asian bullfrog.



AMPHIBIANS

There are more than 5,500 species of amphibians on earth. They are classified into three groups: frogs and toads; newts, salamanders and mudpuppies; and caecilians which are worm-like creatures. Toads, frogs, salamanders and newts are classically associated with wizardry and potions—which may contribute to their “creepy” reputations.

Amphibians spend part of their lives living in the water and part living on land. Once amphibian eggs are laid, the young grow and develop through stages in a process called metamorphosis. They are also ectothermic which means their body temperature depends on the temperature of their surroundings.

These wonderful creatures are often referred to slimy and repulsive, however they play important roles in the environments in which they are found. Typically associated with wetlands and bodies of water, amphibians do need water in which to lay their eggs. And in those areas they are responsible for helping control insect populations, especially mosquitoes. The slimy nature of many amphibians skin has a purpose too. Gary Johnson, a Herpetologist at the Louisville Zoo, would like to share something about amphibians and their skin.



*Clockwise from top left, a Pine barren's tree frog, fire salamander, a blue poison dart frog and a Western lesser siren.
Photo by Will Bird*

Slime coating on the bodies of fish and amphibians is a very important adaptation designed to protect them against any external abrasions and serve as a deterrent to potential predators. It also, in the case of frogs, helps retain moisture and keep the animal from drying out should it be away from water for any length of time. Remember, the only animals which are truly slimy are fish, frogs and their relatives.

GARY JOHNSON

*Gary Johnson and a green tree frog
Photo by Kara Bussabarger*



Amphibians & Reptiles *Continued*

The word "reptile" means "to creep" so it is certainly appropriate to include reptiles in this book.



Human beings owe a great thanks to the snakes that inhabit our yards, fields, barns, garages and even our very homes! As predators, snakes are able to consume animals that destroy our crops helping to guarantee that we have untainted food to eat. Here in our own backyard, the harmless black racer (*Coluber constrictor*) is a snake of which we should all be aware. This common species has a high metabolism and as a result eats large numbers of rodents. This serpent is known to be the most economically important snake in Kentucky since it eats so many crop-destroying and disease-carrying vermin. Most importantly, snakes consume animals that pose a threat to human health. Snakes have an important place in the world and we owe it to ourselves to keep their populations in good order.

WILL BIRD

Photo by Kara Bussabarger

REPTILES

There are more than 6,500 species of reptiles in the world and they are divided into four main groups: snakes and lizards; alligators and crocodiles; turtles and tortoises; and tuatara which are descended from an ancient group of reptiles.

Reptiles have scales to keep their bodies from drying out. Like amphibians, they are also ectothermic. Many reptiles lay eggs, and when they hatch, the young look just like miniature versions of their parents.

The reptiles that probably bring the most immediate and vivid response from people are snakes. The fear of snakes seems to be one of the most universal fears out there. Interestingly enough, most young children who come to the Zoo have no problem seeing snakes up close and even touching them when invited to do so by a Zoo Educator. The fear of snakes is truly a learned behavior. Snakes are very beneficial creatures, as outlined by Zoo Herpetologist, Will Bird.

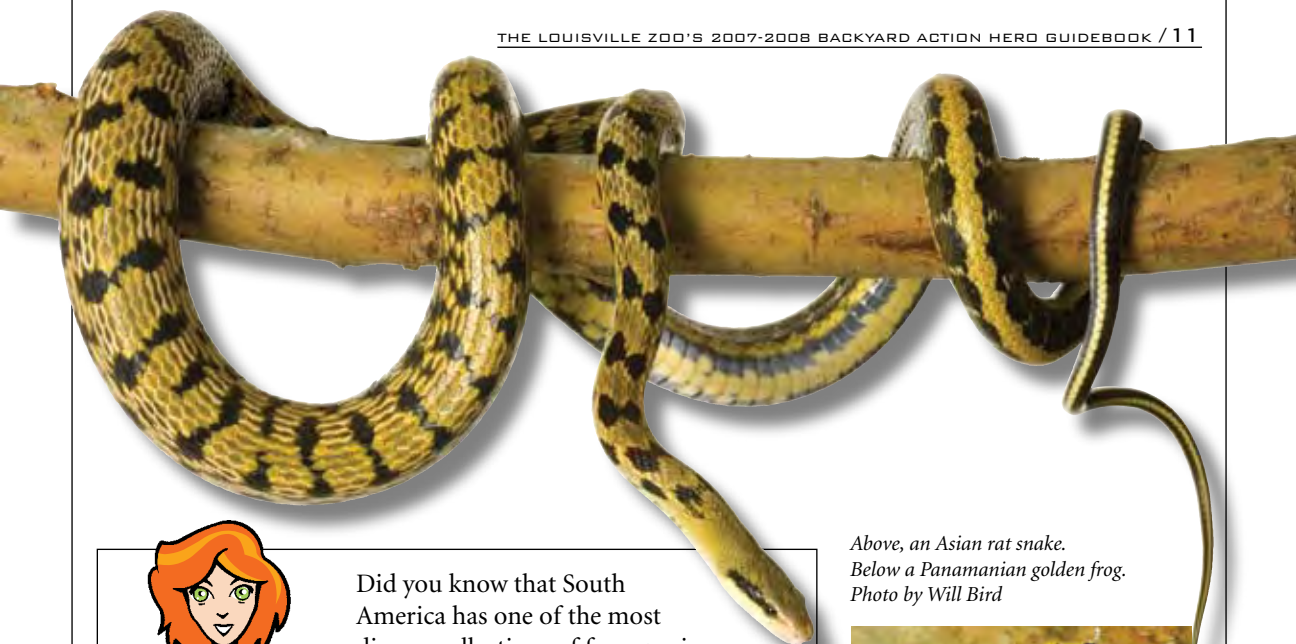


Above, an Cuban crocodile (Photo by L.D. Smith). Below, Will Bird is holding a black rat snake.

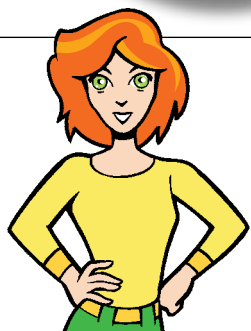


Wood turtle by Kara Bussabarger

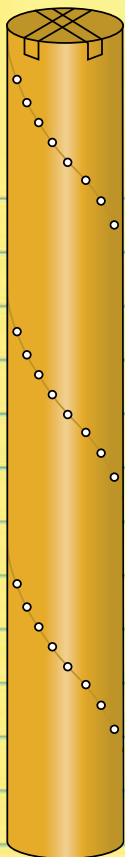




Above, an Asian rat snake.
Below a Panamanian golden frog.
Photo by Will Bird



Did you know that South America has one of the most diverse collections of frog species on the planet? It's true! And the amazing sound of their voices is soothing music to a BAH's ears. You can make your own kind of music with this next project which has its roots in South America.



Lab Project #2:

MAKE YOUR OWN RAIN STICK

Rain sticks are musical instruments found mainly in South America. Traditional rain sticks are made from cacti that have been dried in the sun. We'll use cardboard tubes instead.

Materials:

1 long cardboard tube from wrapping paper or 2-3 tubes from paper towel rolls.
50 – 60 nails (3/4" or 1")
Masking, packing or duct tape
Paper
Markers
Rice or dried beans (small)

Instructions:

1. Use a marker to make dots all along the spiral "seam" of the cardboard tube. The dots should be about half an inch apart.
2. Poke a nail into the tube at each dot. Be sure the nails don't go through the other side of the tube.

3. Use the tape to keep the nails in place. This needs to be pretty strong tape.

4. Cut two circles of paper each a bit larger than the end of the cardboard tube.

5. Tape one of the circles over one end of the tube. Be sure to use plenty of tape so that the end of the tube is completely and securely shut.

6. Put about a handful of rice or beans into the tube.

7. Test the sound by putting your hand over the open end and tilting the tube gently back and forth. Add more rice or beans until it sounds the way you want it to.

8. Use the remaining circle of paper to cover the open end of the tube. Again, use plenty of tape to seal it shut.

9. Tilt the tube back and forth slowly to enjoy the sound of rain.

10. You may decorate the outside with markers or colored paper if you wish.

*This activity was adapted from www.exploratorium.edu.

Bats



Vampire bat

It's true that bats are mammals. But, they are so unique that scientists have put them in a group of their own called Chiroptera which means "hand-wing."

Bats are the creatures of Halloween decorations and vampire movies. But most bats are timid, reclusive animals that are not interested in us and would just as soon be left alone. We benefit greatly from their presence because they remove many millions of tons of insects from the environment throughout the world. The Louisville Zoo has both fruit bats and vampire bats. Despite their movie reputation, vampires are not as scary as they are portrayed to be. Linda Shoen works with vampire bats in the Zoo's HerpAquarium and has this to say:



Above, fruit bats and below a fruit bat colony.



Here in Kentucky, we have a great number of caves.

In fact, Mammoth Cave is the longest cave system in the world. Those caves house a lot of really unusual and important species. Some of those species are considered "creepy" by many people.

The one that comes to mind first is actually a mammal—a bat. There are more than 1,000 species of bats worldwide.



Photo by Kara Bussabarger

The vampire bat is the only species of bat to feed on the blood of warm-blooded animals. That, and the way they move along the ground like a spider, makes this bat one of the "creepiest." The common vampire bat, which I take care of at the Louisville Zoo, feeds on blood from mammals such as cattle, horses and pigs. Unlike those seen in most movies, vampire bats are actually quite small reaching just 3 to 4 inches in body length. They do not suck the blood from their "victim." These bats use their grooved tongues to lap the blood from a small bite wound made with their razor sharp teeth. The bite is painless and chemicals in their saliva prevent the blood from clotting while feeding, however, their bite can be dangerous because vampire bats can spread the rabies virus. A bat will spent up to 30 minutes feeding and drink about 2 tablespoons of blood leaving the bat so heavy it can't fly and has to crawl away to a safe place to digest its meal.

LINDA SHOEN

Lab Project #3:

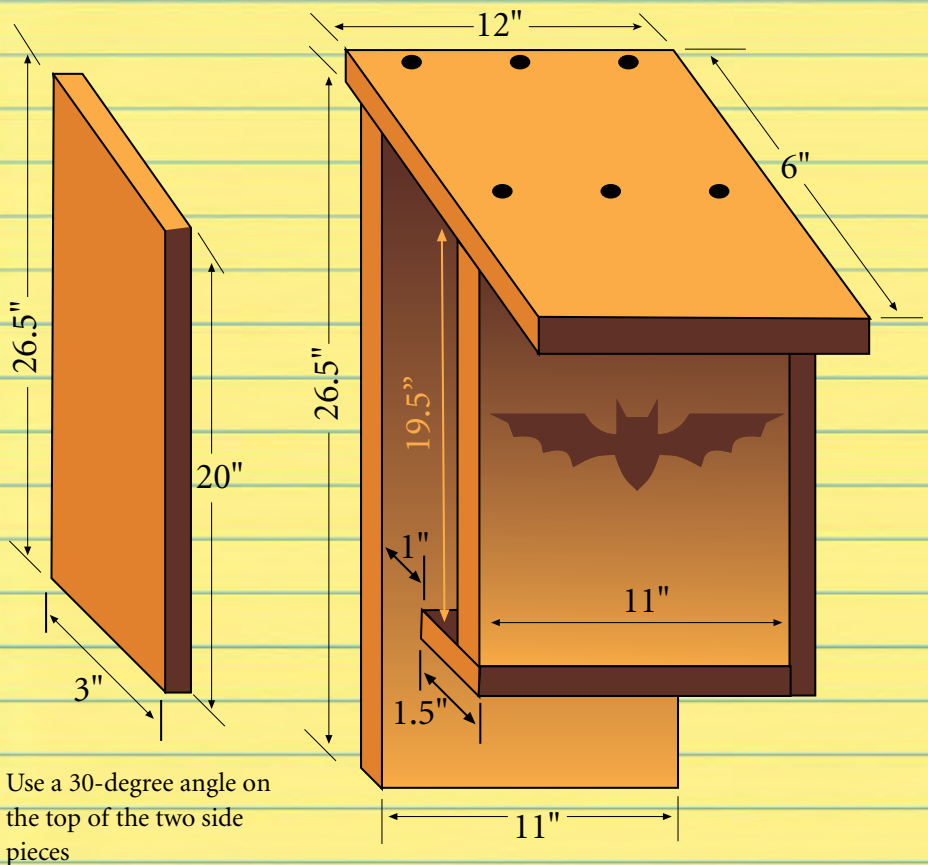
BUILD A BAT HOUSE

With your parents' help and permission, you might want to build a bat house to put in your yard. But just remember that you should never touch a bat with your bare hands. And don't be discouraged if bats don't occupy your house right away. It often takes weeks or even months.

Use 1/2" plywood. Paint a dark color to absorb heat. Make all interior surfaces rough to enable bats to easily climb. Affix to house or shed wall out of reach of cats and dogs. Assemble with screws.



You know by now that most bats are beneficial – so why not invite some into your backyard? Just follow these easy instructions and build your own bat house!



Caulking all the seams will help make the structure water-tight.

Learn More About It!

Everyone tends to have their own idea of what animals are creepy and crawly. When the Zoo's Education department teaches people about the true nature of the world's creatures, people often discover that their fears are unwarranted. The fears we develop as kids and young adults are often passed on to us from others. These fears are learned behaviors, but they don't have to be.

Kathleen Johnson is an Educator at the Louisville Zoo and teaches about Creepy Crawlies all the time. Let's hear what she has to say about the subject:

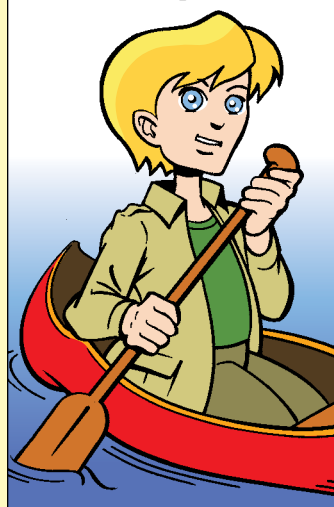
When animals slither, do you shiver? When animals crawl, do you cringe? I often see these reactions when I show certain creatures in my classes. But I always remind people that they will have a safe experience when they are with me!

As an Educator at the Louisville Zoo, I love to teach with education animals such as snakes, lizards, frogs, spiders and worms. Kids are usually fascinated by these animals, though they may feel a bit of fear at first. I help people to understand why creepy crawly animals are so important to our planet, and that they are cool to learn about. When people touch a snake for the first

time, excitement can be seen on their faces, and kids are thrilled to see a millipede crawl on hundreds of rippling legs. In our classes, you might also see a tarantula's shiny, sharp fangs up close, or hear a hissing cockroach, which usually makes kids gasp with delight! It is exciting for me to share hands-on learning experiences with people in my classes, and hopefully you can join me sometime!

KATHLEEN JOHNSON

By learning more about the creatures with which we share this planet, we can avoid the fears and misconceptions that have been created about these animals. It is the role of a Backyard Action Hero to help spread knowledge about our living world. By doing so, we can help protect the living things in our own backyards as well as all over the planet.



LOG ON AND LEARN MORE

With the permission of your parents or teachers, surf some of these great websites to learn more about the kinds of animals featured in this book!

www.ecokids.ca/pub/eco_info/topics/frogs/quiz/quiz_1.cfm

www.actionfornature.org

http://www.bbc.co.uk/nature/reallywild/features/cc_index.shtml

www.nationalgeographic.com/kids/games

<http://biodiversity.wku.edu/salamanders>

www.fi.edu/fellows/fellow9/jun99

<http://www.pbs.org/wgbh/nova/odyssey/hotsience.html>

<http://www.uksafari.com/creepycrawlies.htm>

<http://www.insects.org/>

<http://www.batcon.org/home/default.asp>

<http://www.batconservation.org/>

<http://www.lubee.org/>



Kathleen holding a shingleback skink. Photo by Kara Bussabarger

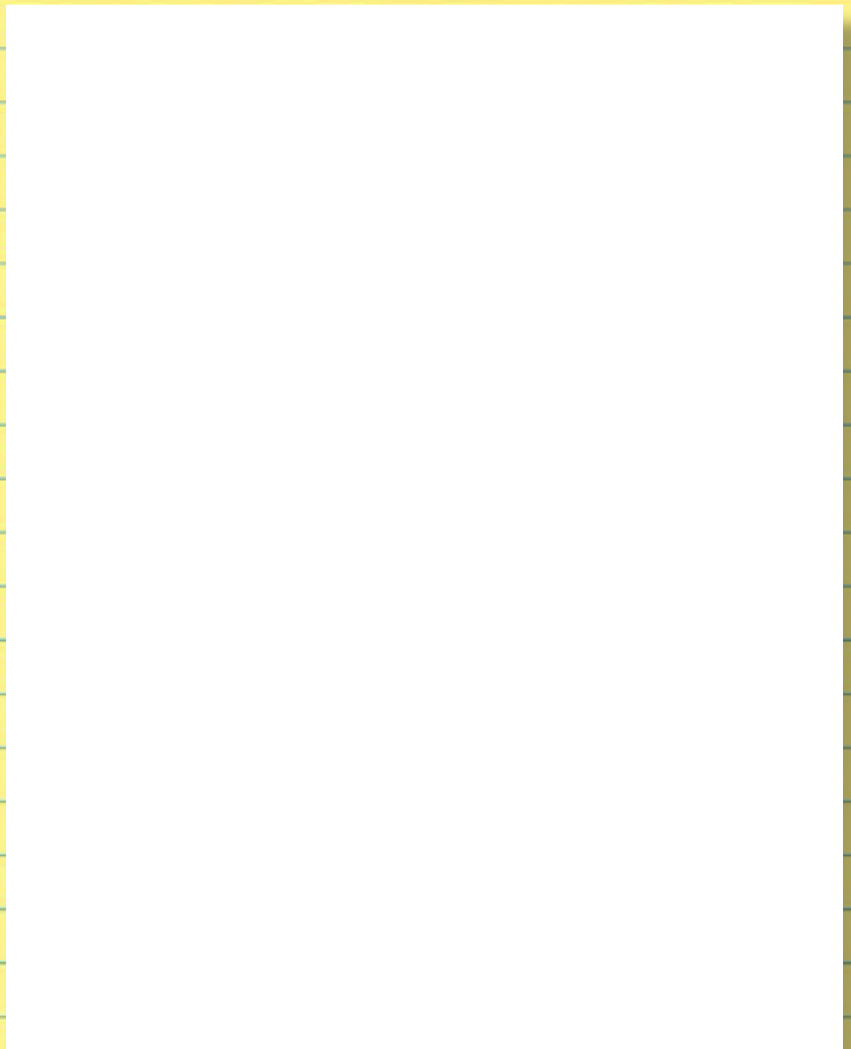
Lab Project #4:

PORTRAIT OF A CONSERVATION HERO

It takes all kinds of efforts—both large and small—to protect our planet. There are some people who have devoted their lives to making a difference for conservation. You've read about some of them in this book.

Do you know of someone else who has gone above and beyond when it comes to conservation? Maybe it's a teacher who has an outdoor classroom. Maybe it's someone in your school who started a recycling program or heads up the environmental club. Maybe it's YOU!

Use this space to write a profile of someone you think deserves the title of Conservation Hero! You could even draw a picture of the hero in action on a separate sheet of paper.

A large white rectangular box intended for a student to write a profile of a conservation hero. The box is positioned on the right side of the page, below the introductory text. The background of the entire page is a yellow sheet of lined paper with horizontal blue lines and a vertical red margin line on the left.

Get Involved!



There are lots of ways a BAH can get involved in helping us all protect our planet. Helping often starts with learning more about what is going on in our own backyards and you've already started doing that! Here are a few more things you can do.



Reduce, reuse and recycle

Organize a cleanup day and pick up litter around your school or in a local park.

Find ways to conserve around your house. Turn off the water while you brush your teeth. Replace burned out light bulbs with compact fluorescents. Turn your thermostat up or down a couple of degrees (up in the summer, down in the winter).

Try to buy products made of recycled materials. Take cloth bags to use at the grocery store. Also, choose to buy products with the least amount of packaging. That means there's less to throw away.



Learn as much as you can about animals and their habitats and how to help preserve them. The Louisville Zoo is a good place to start.

Let us know what you are doing as a BAH. Contact us through the Louisville Zoo website at www.louisvillezoo.org/BAH.

VISIT THE ZOO'S WEBSITE

to learn more about threatened and endangered species you can see at the Louisville Zoo and conservation projects the Zoo is involved with around the world. You can also find events, classes, night safaris, birthday parties and other ways to learn about your favorite animals.

www.louisvillezoo.org

THE LOUISVILLE ZOO IS OPEN

year-round March through Labor Day 10am to 5pm (exit by 6pm). September through February, 10am to 4pm (exit by 5pm).

Closed Thanksgiving, Christmas and New Year's Day.

YOU CAN NOW BUY ZOO TICKETS ONLINE!



PRESENT THIS COUPON AND RECEIVE

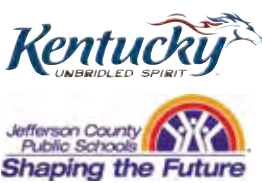
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