

TOYOTA



Presents

SAVING SPECIES: NATURE IN NEED



LOOK INSIDE!

Activities and articles align with grades K – 5
science and English language arts standards.



What is a Backyard Action Hero?

A Backyard Action Hero is a kid or adult who is really into nature and wildlife and is ready to take action to protect them. They care about the animals and habitats in their own backyards as well as all around the world. They know that to make a difference they not only need to learn, but also to act. This guidebook will help you learn about the natural world around you and how you can help nature in need. Since the Louisville Zoo is a great place to learn about plants, animals and ways to help our wonderful world, your guidebook will also give you a peak at what's happening at the Louisville Zoo!

Welcome Future Heroes!

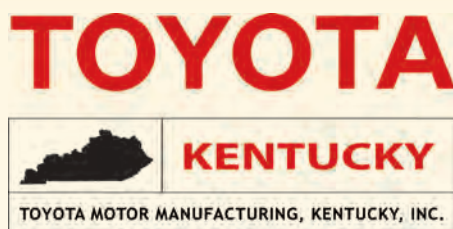
At Toyota Motor Manufacturing, Kentucky, Inc. (TMMK), we believe that protecting the environment is part of our mission to be a good neighbor across Kentucky. As we build cars in our plant in Georgetown, we are committed to protecting the environment, following environmental laws, preventing pollution and continuously improving our processes. Our commitment doesn't stop there — and neither should yours! It is everyone's responsibility to protect the environment.

By becoming a Backyard Action Hero, you commit yourself to taking an active step to coexist and learn about nature and wildlife. Once you have learned about some of the things in this book, you will be ready to take conservation action to your backyard and beyond. Good luck Heroes!

Sincerely,

Your Friends at

Toyota Motor Manufacturing, Kentucky, Inc.



The Louisville Zoological Gardens, a non-profit organization and state zoo of Kentucky, is dedicated to its mission to “Better the Bond Between People and Our Planet” by providing excellent care for animals, a great experience for visitors, and leadership in conservation education. The Zoo's collections which include botanical gardens are accredited by the Association of Zoos and Aquariums (AZA) and the American Alliance of Museums (AAM). The Louisville Zoo is also an agency of Louisville Metro Government.



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SAVING SPECIES

Your role in protecting our planet...

Isn't nature wonderful? Every day we go outside and the wonders of nature are all around us: land, water, plants and wildlife.

It's important that we protect and care for the world around us so that we maintain a healthy environment for everyone!

The key to protecting our world is conservation. In this issue of Backyard Action Hero, you will learn about some of the species that are struggling and need your help.

Many of the animals you read about here, you can visit and learn more about at the Zoo.

Human activity has had a large impact on many of these species. The expansion of agriculture, human settlements and even poaching (illegal killing of animals) has left these animals at risk due to loss of their natural **habitat** or **places they live**.

For example, you'll learn about the southern white rhino. The southern white rhino has a conservation status of near threatened. The **conservation status** of an animal lets us know how likely it is that an animal species will become **extinct** or no longer exist. Southern white rhinos are struggling because of poaching and loss of their habitats.

You'll learn about the Saharan addax. This rare antelope is almost extinct in the vanishing wild because of hunting and oil exploration.

We'll also invite you to meet our Komodo dragon, Romulus. Komodo dragon populations are at risk due to **deforestation**: meaning their forest habitat is being cut down for human use. All of these animals are affected by human activity — but you can make a difference.

Protecting the world around you may seem like a big job, but when everyone helps we can make an impact. Just by reading this, you have already begun! It all starts with becoming informed about the world around you. Start your journey on the path to becoming a conservation hero and learn about the wonderful animals that need your help. After you have finished reading, you can visit some of the amazing animals in this guidebook at your Louisville Zoo!

By educating Zoo guests about wildlife conservation through amazing encounters with animal ambassadors and nature, the Louisville Zoo works to demonstrate how our actions at home impact our world and inspire guests to consider their role in the balance of the health of our planet.

For more Backyard Action Hero content, visit LouisvilleZoo.org/BAH

BUZZY BEES!

Imagine a world without apples, almonds, peaches, blueberries, cherries, eggplant, peppers, pumpkins and even tomatoes. Did you know bees are the reason we have so many yummy things to eat? Bees are important! They are pollinators. That means they move pollen from one plant to another, which helps them to create more plants and flowers. A bee may visit over 5,000 flowers in one day! Many of the plants they visit create food for people to eat. Did you know our favorite fruits and vegetables would be gone from stores if we didn't have bees, butterflies, and other pollinators to help us?

MIX AND MATCH: LEARN ABOUT BEES!

Bees are really amazing creatures! Find the answer to the question and write the letter in the honeycomb below. Having trouble? Here's a tip — look for the matching bees!

What are Bees?



A



What is honey?



Why do bees fly?



Who is the queen bee in the hive?



Will bees try to sting me?



Where do bees live?



What is honeycomb?



Why do bees make honey?

How Can You Help?

Bees need your help. They are struggling to survive because of the things we humans do! Loss of places to live, parasites and pesticides are all hurting bees and other pollinators. What can you do to help?

- **Encourage your parents not to overuse pesticides in your yard or mow too much.** When lawn flowers bloom, they are food for bees, especially in springtime.
- **Plant some flowers.** Bees need flowers to make the honey they eat, so ask your parents for help to plant lots of flowers for them to visit.
- **Don't swat at bees or bother their bee hive.** A honey bee usually won't sting people because they are too busy collecting nectar.
- **Give them water.** Bees need water. Set out a shallow tray of water for bees to drink.



A



Bees are insects. They have six legs, three body parts, antennae and wings. They can fly backwards and hover.

F



Bees make honey from flower nectar. Bees are the only insect that makes food people will eat.

D



Bees fly from flower to flower carrying pollen and drinking nectar. They will fly over two miles a day.

B



There is only one queen in the hive. She lays all the eggs and worker bees feed her special honey called Royal Jelly.

G



No. Bees will only sting if they feel they are in danger. If you don't bother them, they won't bother you.

E



Bees live in hives. The hives have honeycomb. The comb is made up of little cells. Baby bees grow up in the cells and honey is stored there too.

C



Bees make honeycomb from glands in their sides. They chew the wax that comes out and make honeycomb.

H



Honey is food for bees during the winter. When people harvest honey they must leave some for the bees.

BATTY FOR BATS!

Did you know Indiana bats are really helpful creatures? Some people think they are scary, but bats help us out by eating all kinds of pesky flying insects found along rivers and lakes. Their role in insect control is huge — these little bats can eat up to 1,000 mosquitos in an hour!

No Bats in Sight?

Indiana bats are classified as near threatened. In 2007 a terrible disease hurt hibernating bats in North America. White-nose syndrome, named for a white fungus that appears on the nose of the bat, causes strange behavior during cold winter months. Bats might wake up early from hibernation, fly outside, or group together near the entrance of the cave where it's too cold! This disease has killed a lot bats. Right now scientists are studying the disease to develop ways to control it.

Bats are sensitive! They have a hard time recovering if bothered during their hibernation period. Indiana bats have very little stored fat to get them through the winter. Every time a bat wakes from hibernation it uses energy. It needs that energy to survive all winter until the insects return.

These bats like to hibernate in large groups. If a cave is just right, there could be as many as 50,000 bats living there! That is a lot bats all in one location. We should be careful not to disturb them.

The Zoo's Bat Ambassadors

At the Louisville Zoo you can find two species of bat: the vampire bat and the Rodrigues fruit bat!

What do all three of these bats have in common?

- They live in colonies.
- They have similar coloration, black and brown.

How are these bats different?

Indiana Bat

- Lives in North America
- Eats Insects

Vampire Bat

- Lives in Mexico, Central America, and South America
- Feeds on blood

Rodrigues Fruit Bat

- Lives on Rodrigues Island
- Eats fruits and flowers

Can you guess which one of these bats is not always nocturnal (active at night)?

Answer: The Rodrigues fruit bat!



Indiana Bat



Rodrigues fruit bat



Vampire bat

HOW CAN YOU HELP?

Do Not Disturb

Very few caves have the right conditions for bats. Bats rely on these caves. People should stay back from cave entrances. Some caves are fitted with a gate. The gate allows the bats in while keeping people out. If you ever see a bat, make sure you don't touch it — they are delicate!

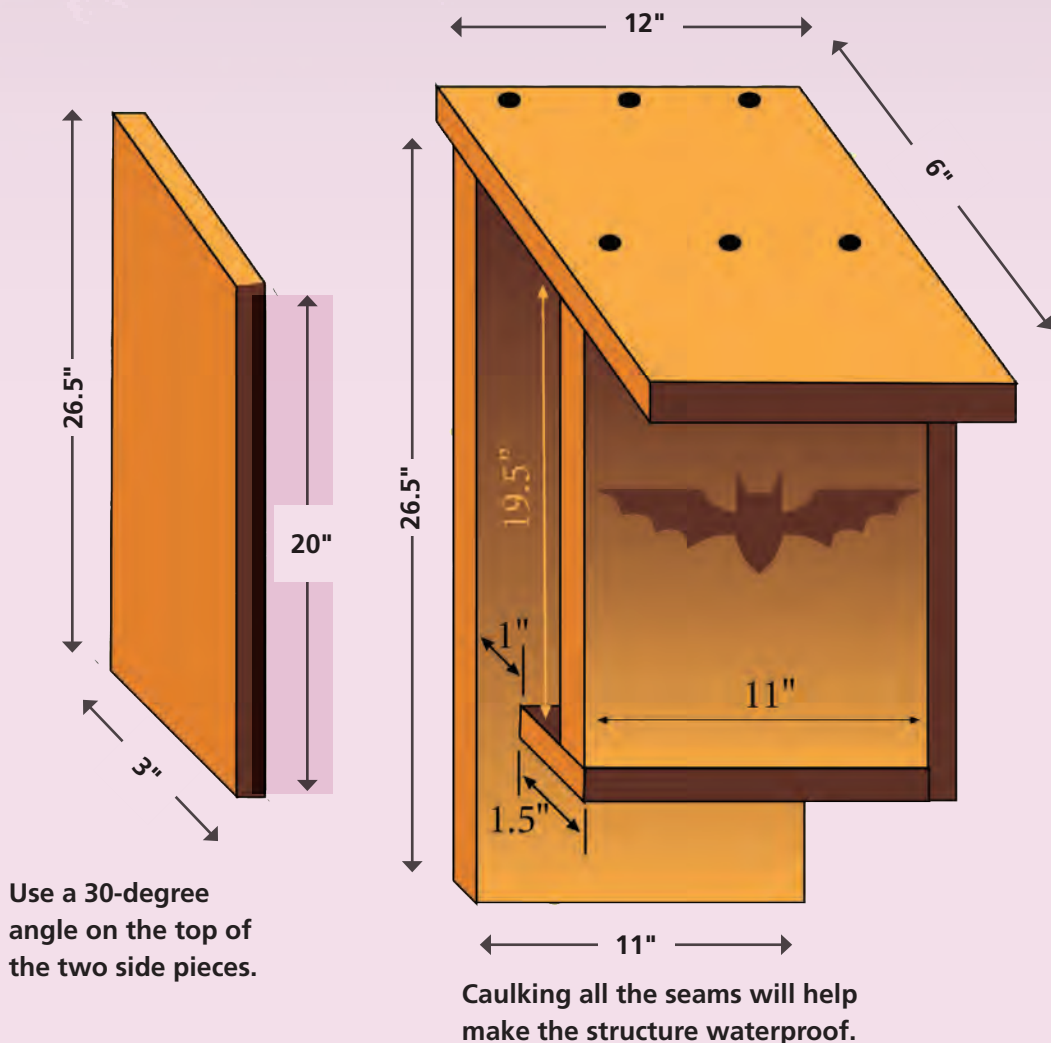
Build a Bat Box

Even though bats spend the colder months in caves, in warmer weather they look for new homes.

Try building a bat home in your own backyard with your parents' help and permission!

Just follow the instructions below. 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.



theZOO


L O U I S V I L L E

LOUISVILLEZOO.ORG/BAH

A light
colored coat
reflects the sun's
heat.

Large horns
help to battle
for territory.

You
can visit
real addax in
the Louisville
Zoo Africa
Zone!



Hoooves are
spread out for
better desert
traction.

The critically endangered Saharan addax is one of the **most endangered antelopes on Earth**. It was driven to near extinction due to being hunted by soldiers and loss of habitat from oil installations in its native home of Niger.

The total number of addax left in the wild is estimated to be **less than 100 animals**.

Emergency measures are being put into place to help save the addax from imminent extinction.

Your Louisville Zoo will play a role in these measures as we participate in the addax's Species Survival Plan (SSP), a coordinated breeding program working to achieve a healthy, genetically diverse managed animal population.

The SSP will work with Sahara Conservation Fund and other conservation entities in the attempt to restore and safeguard addax in the Sahara.

SAVING THE SAHARAN ADDAX

ALL ABOUT RHINOS

Did you know that the word rhinoceros actually comes from the Greek words that mean “nose” and “horn”? These beautiful, big-bodied beasts have inspired wonder and curiosity for many thousands of years!

After elephants, rhinos are the second heaviest land animals around. How big do the rhinos get? Well, the Louisville Zoo's southern white rhinos, Letterman (3 years old) and Sindi (34 years old) can grow to be more than 6 ft. tall, and weigh over 6,000 pounds!

White rhinos live in the tropical and subtropical grassland areas on the continent of Africa. Most live in only four African countries: Kenya, Namibia, South Africa, and Zimbabwe. Can you find these on a map?

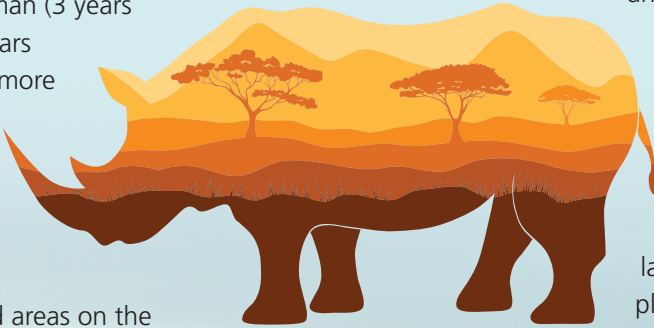
Male rhinos are called bulls, and the females are called cows. Can you guess what the babies are called? That's right — calves! Female rhinos usually have only one calf at a time. A mother rhino will nurture and teach each one important life skills, and she won't have another baby for another 3 or 4 years.

Many rhinos live life on their own once they become adults. White rhinos, though, may travel around in groups called “herds” or “crashes.” Living in herds can be a great survival strategy! With more eyes to look around, more ears to hear all sounds and more noses to smell for danger, rhinos stay pretty safe from predators. There are not too many animals out there that would take on adult rhinos!

What do you suppose rhinos do all day? Most rhinos roam over large areas eating plants and grass along the way. Did you know rhinos can eat as much

as 120 pounds of grass a day? Humans usually only eat between 3 to 6 pounds of food per day! How much food do you think you eat?

In between eating, rhinos also rest and sometimes search for a place to wallow in the mud. Why would they do that? Well, in the tropical areas where they live, it does get pretty toasty with the hot sunshine beating down during the day. Since rhinos don't sweat, how



do they cool off? Mud, of course! You may think it sounds weird for a big creature to roll around in some gloppy mud, but to a rhino, that is like a cool day at the pool! What could be a better sunscreen than a thick coating of mud? Not only does rolling in the mud help to ease the heat, it protects their skin from biting insects and parasites.

Look out! How fast can you run? If something spooks rhinos, they will charge directly at the source of the threat with their sharp horns facing front. Rhinos can move pretty quickly, in spite of their size. They can run at speeds up to 40 miles per hour. Most humans can run about 15 miles per hour at their fastest.


Horns are the rhino's best tools for protection from carnivores and to show other rhinos who is the boss! Black, white, and Sumatran rhinos all have two horns—a larger one at the very front of the face, and a shorter one closer to their eyes.

Do you know what rhino horns are made of? They are made of a protein matter called "keratin." Did you know we also have keratin on our bodies? Take a look at your hair, fingernails and toenails! These are also made

of keratin. Pretty cool, huh? And just like our hair and nails, rhino horns continue to grow throughout their lives.

Why are rhinos so important? Rhinos help keep a healthy balance in nature. They help make the soil richer with their poop. Poop? Yes, poop! Rhino poop can also spread plant seeds! Many people who live in Africa rely on the tourist money that rhinos help to bring in. They are beautiful, majestic, and they help shape the habitats in which they live.

Each year, there are fewer rhinos on our planet. Southern white rhinos are classified as near threatened but many other species are critically endangered, and some are even extinct — meaning they no longer exist! Why is this? Rhino habitat in the vanishing wild is shrinking. Big animals like rhinos need a lot of space to find food. Rhinos are also hunted illegally. Some people believe that rhino horns can cure certain illnesses. You can see that rhinos need our help, but there is hope. There are many people around the world who are working very hard to try to make sure we always have rhinos to enjoy on our planet!

A photograph of a rhinoceros in a savanna landscape. The rhino is in the foreground, facing left, with its head and front legs visible. In the background, there is a large, spreading acacia tree on a grassy plain under a cloudy sky.

I can't imagine a world without rhinos, can you? What can you do to help rhinos?

Be a great ambassador for rhinos and learn all you can! Then, get your friends and family to help:

Work with your parents or teachers to organize a fundraiser at your school, church or community center to help rhinos!

Have a "penny war," bake sale and more — then donate the money to organizations like Save the Rhino International or use the funds to adopt a rhino at the Zoo to help support its daily care.

LUCKY CRANES



The red crowned crane lives in East Asia in China, Russia, Korea and Japan.

In East Asia, these cranes are a symbol for long life, good health and luck! Many people even keep paintings of them in their homes.

Like the whooping cranes of the United States, red crowned cranes are rare and **endangered**. They are easy to spot with a mostly white body and a red patch on top of their head — if you are lucky enough to see one.

Do you think you are taller than a red crowned crane? This is one big bird! These cranes can weigh up to 22 pounds and grow up to five feet tall. When the cranes spread their wings out, they can be as wide as eight feet! How far can you spread your arms?

Red-crowned cranes like wet places. They live in swamps with water so they can use their long legs to walk through and look for food. We call these places wetlands. Cranes eat the bugs, fish and frogs that live there by catching them with their sharp beaks. One of the main reasons why cranes are endangered is because the wetlands where they live are being destroyed.

How can you help cranes and their wetlands?

Pick up any litter you see and make sure it's thrown away or recycled! Loose trash can end up in crane habitats.

Did you know the Louisville Zoo has red-crowned cranes?

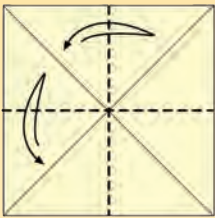
You can see them just outside Glacier Run on the way to the NEW snow leopard exhibit (coming in 2019). Visit the Zoo to learn more about red-crowned cranes, then — let's do all we can to help protect our wetlands so that cranes have a place to live!

MAKE A CRANE!

Some people believe that making a paper crane is good luck! Use the instructions below to fold paper and make your very own paper crane. This Japanese art of folding paper into shapes and figures is called origami. While you are making your paper crane, think about the ways that you can help cranes have good health and good luck too!

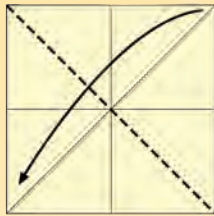


①



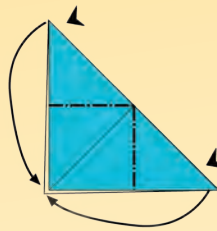
Fold and unfold on the dotted line

②



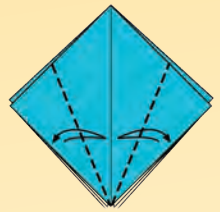
Turn paper over to fold and unfold on the diagonal lines

③



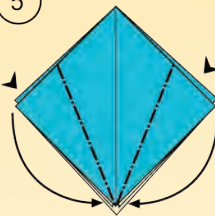
Fold outer corners inside toward the top corner

④



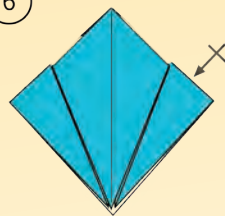
Fold and unfold the top layer of paper to the inside crease.

⑤



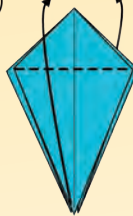
Push the outer corners inside to the crease like in step #3.

⑥



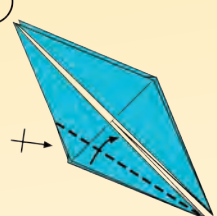
Repeat steps 4 and 5 on the opposite side.

⑦



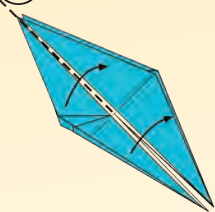
Fold and unfold on the dotted line, then fold open the bottom corner.

⑧



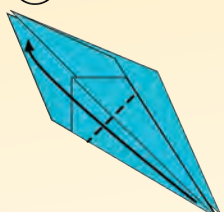
Fold flaps in on dotted line (front and back left side).

⑨



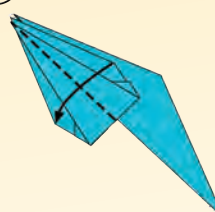
Pick up single layer and fold over on crease

⑩



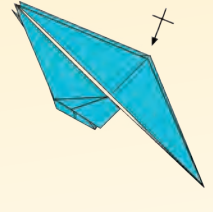
Fold up bottom corner of layer on dotted line.

⑪



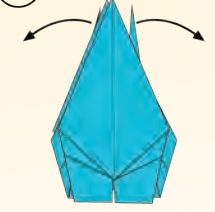
Pick up single layer. Fold on dotted line

⑫



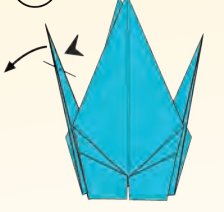
Repeat steps 8 through 11 on the opposite side.

⑬



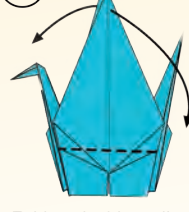
Pull smaller layers outward to create head and tail of crane

⑭



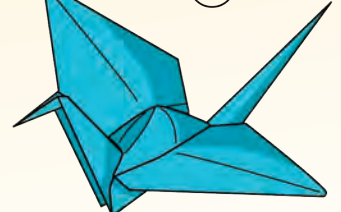
Reverse fold tip of crease inside to form the head

⑮



Fold each side on line to form wings!

⑯





They might be the largest of the lizards, but the Louisville Zoo's new Komodo dragon Romulus, only 10 months old, has quite a bit of growing to do before he can claim his reptilian fame. With sharp teeth and a deadly bite, he will also grow to be one of nature's most powerful predators. When he reaches maturity, he could be over 10 feet long and weigh over 150 lbs. HerpAquarium keepers like Chris Florence will be caring for this little guy to make sure he is healthy and on the right track to adulthood.

A KEEPER'S PERSPECTIVE

What are some differences between caring for a young Komodo dragon and an adult Komodo dragon?

Young Komodo dragons are very shy and nervous. It takes time for them to get used to people. You have to be careful of quick movements, loud noises or large objects hovering over them.

This is a natural behavior as older Komodo dragons will sometimes eat young Komodo dragons. To avoid the larger dragons that are too large and heavy to climb, young dragons live in trees for about their first five years of life. Once large enough, they move to the ground.

The younger dragons eat smaller prey like small lizards, eggs, birds and frogs.

Adult dragons will eat anything they can! They aren't scared of anything and will stand their ground if threatened.



What's up with those long Komodo claws and that big tail?

Komodo dragons have long claws for a variety of reasons. Young dragons use them to climb and grip onto trees. Adult dragons use them to dig for food sources like eggs, to make burrows to lay their own eggs in and to escape from the intense heat of the day. A long tail helps young dragons to balance. The adult dragons use their tail as a way to ward off other dragons or other threatening individuals.

What is the biggest threat to Komodo dragons?

Komodo dragons are classified as vulnerable. They are native to the islands of Indonesia. Because their habitat is so isolated, sudden change can mean huge problems. Lots of the trees and forests are being cleared for human settlement. Living on an island also limits the types and amount of prey available for Komodo dragons to eat.

Why do you feel that the Komodo dragon is important for people to meet at the Zoo?

They are the largest lizard in the world and are awesome and intimidating to see up close! They are also great animal ambassadors, teaching people of all ages about reptiles, island species and why they are important. It's great for people to see wonderful animals like Romulus in person so they can learn to appreciate his fragile native Island home and the Komodo dragons that live there!

What is the best thing about being a reptile keeper at the Louisville Zoo?

The best thing about being a reptile keeper at the Louisville Zoo is working with a large variety of animals. I get to help take care of snakes, lizards, amphibians, arachnids, crocodilians, fish, invertebrates, venomous species and even some mammals. There are new experiences every day!

What can kids do to help our reptile friends?

Pay attention to the many different species of reptiles and amphibians in their native homes. These animals are very sensitive to environmental changes and are usually the first to show signs that something is wrong. Kids can help by recycling, cleaning up litter and making sure toxic things are stored properly. Being a good ambassador for the environment starts by learning about reptiles and spreading the word on how to help. One day, if they work hard, they may even have the honor of caring for these awesome creatures!



Want to see our young Komodo dragon in action? Visit Romulus in the HerpAquarium and check out his new exhibit at the Louisville Zoo! Currently, he is in a modified space created just for him due to his small size. When he grows, he will inhabit the full outdoor space in that same area!



Present this coupon and receive

ONE FREE CHILD'S ADMISSION

With the purchase of one regular adult general admission to the Louisville Zoo.

Valid during regular Zoo hours. Not valid with other offers, for ticket packages, "The World's Largest Halloween Party!" Presented by Meijer or other after-hours events. One ticket per transaction.

Expires 9/30/2019



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BACKYARD ACTION HERO MENTORS!

Hello teachers and parents! Help your kids on the path to becoming Backyard Action Heroes. Use the resources within for guided lessons, activities and fun experiments.

For additional education materials, more Backyard Action Hero content and a chance to win a free behind-the-scenes tour of the Louisville Zoo, visit LouisvilleZoo.org/BAH.

TEACHER E-MAIL UPDATES

Stay updated on educational events at the Zoo by signing up for our free e-mails.

To join, visit LouisvilleZoo.org/TeacherEmail

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Additional support from



The Louisville Zoo, a non-profit organization and state zoo of Kentucky, is accredited by the American Alliance of Museums and by the Association of Zoos and Aquariums.