Alden B. Dow Museum

Frogs! a chorus of colors

A Guide for Educators 2014

JAN. 18 - MAY 11

Midland Center for the Arts
Pre-Arrival Information

Booking a Tour
If you have not already done so and would like to schedule a tour for your group, you can do so by contacting our education department at museumtours@mcfta.org.

Pre-Tour Orientations for Teachers
We encourage educators to plan ahead for their tour and to consider visiting the exhibit in advance and walking through it with museum staff. This will allow you to formulate pre- and post-lessons and prepare your students for their visit. Please call to arrange this type of visit. Recommended times are after 2:30 pm when most tour groups have left for the day.

Upon Arrival
You may be asked to divide your group into smaller groups when you arrive. The number of groups needed will depend on the size of your group and other groups in the museum at the time of your visit. Each group will be assigned one or more chaperones.

Education Entrance
A docent will meet you at the entrance facing West St. Andrews Rd and the Library. Please do not enter through the front of Midland Center for the Arts.

Chaperone Responsibilities
• Chaperones are responsible for supervising groups and making sure they follow the Museum rules.
• Chaperones must accompany their groups at all times while they are touring the Museum. Your chaperones’ interest and attention adds to your class’s tour experience.
• Chaperones are asked to assist the students and continue to supervise while at lunch or in the restrooms.
• Chaperones are responsible for supervising the students in the gift shop.
• Chaperones are asked not to bring infants or younger children with them as this can be a distraction for the students and divert their attention from the group.
**Lunch**
The museum has indoor lunchroom facilities and there are outdoor spaces to picnic if weather permits. These spaces must be reserved at least one week in advance of your trip, as they fill quickly. It is best to make your reservation when you book your tour. We provide tables and chairs; however, if your group is large, some of the students may have to eat picnic-style on the floor. Please have your group clean up after themselves.

**Museum Etiquette**
- Do not touch or lean against any furniture, walls or items in the galleries on the fourth floor.
- Hall of Ideas is the *only* constant hands-on area of the Museum.
- Food, drinks, gum, and smoking are not permitted in the Museum.
- Stay with the group leader at all times.
- No running is allowed in the Museum.
- Please use indoor voices.
- Photography is allowed in the Hall of Ideas. Photo policies in the exhibitions on the fourth floor galleries vary based on the exhibition and policies of the lending institution or individual.

***Hands-on and photography policies in the fourth floor galleries may be altered depending on the exhibit, please inquire when scheduling or with your tour guide.***

**Midland Center for the Arts is located**
at the corner of Eastman Avenue and West Saint Andrews Road.

**From the South:** Take US-10 West to the exit for Business US-10/M-20. Drive 4.9 miles. MCFTA will be on the left.

**From the North:** Take US-10 East to the Eastman Avenue exit. Turn right onto Eastman Avenue. Drive 2 miles. MCFTA will be on the right.

**From the West:** Take M-20 into Midland. Turn left onto Indian Street, which will turn into Eastman Avenue. Drive 0.5 miles. MCFTA will be on the left.

Midland Center for the Arts
1801 West Saint Andrews Road
Midland, MI 48640
WHAT IS A FROG?

Frogs are amphibians that belong to the biological order “Anura” which means without tail. Frogs, salamanders, and caecilians are modern amphibians. These part-time land animals have no hair or scales covering their skin and most lay eggs in water. Frogs are the only amphibians without tails - they also lack necks. Most have short bodies, bulging eyes, and powerful legs. Frogs are the most successful amphibians by far. There are over 5,360 species of frogs living on every continent except Antarctica!

Frog Lifecycle

Most frogs and other amphibians hatch from an egg as fish-like larvae called tadpoles. Tadpoles exist to eat and grow and eventually transform into froglets – a process called metamorphosis. These soft globs of flesh provide tasty morsels for snakes, fish, birds, and even other frogs. The tadpole stage can last for days or years, depending on the species and the weather.

What is the difference between a frog and a toad?

<table>
<thead>
<tr>
<th>FROG</th>
<th>TOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>smooth, moist skin</td>
<td>rough, drier skin</td>
</tr>
<tr>
<td>no warts on body</td>
<td>have warts on body</td>
</tr>
<tr>
<td>narrower body and waist</td>
<td>broader, flatter body</td>
</tr>
<tr>
<td>live near or in water</td>
<td>live on land, breed in water only</td>
</tr>
<tr>
<td>longer hind legs for hopping</td>
<td>shorter hind legs, walks rather than hop</td>
</tr>
<tr>
<td>webbed hind feet for swimming</td>
<td></td>
</tr>
<tr>
<td>eggs are in massive lump of cloudy jelly</td>
<td>eggs are long and stringy, wrapped around water plants</td>
</tr>
</tbody>
</table>

EVOLUTION

Evolution is the process by which different kinds of living organisms are thought to have developed and diversified from earlier forms during the history of the earth. Some 365 million years ago finned, aquatic animals evolved into tetrapods, the first four-legged vertebrates. Over time this new animal group moved onto land and gave rise to mammals, reptiles (including birds), and amphibians. Today frogs and other amphibians live in all but the harshest land, environments but many remain tied to water for development of their eggs and tadpoles.
**BEHAVIOR & RESPONSE TO ENVIRONMENT**

Many species of frogs have developed behavior or patterned actions using their genetic make-up to help them survive in their surroundings or environment. These behaviors are often tied to, but are not limited to a frog’s appearance. Color, skin texture, structure of their bodies and organs has allowed these little wonders to both escape the animals that hunt them known as predators and help the frogs hunt prey.

Fire-bellied toads use skin color for protection. When disturbed, the toad throws its legs into the air, revealing a bright orange “fire belly.” If flashing these bright colors doesn't scare the predator, the toad has toxic skin secretions that make it an unpalatable meal.

Horned frogs have voracious appetites, but they are not built for chasing down prey. They bury themselves in leaves or loose soil and pounce on small animals that blunder by. When harassed by a human or other large animal, these fearless frogs lunge and snap their huge jaws. Like little green bulldogs, they bite and hang on until pried loose.

Other behaviors frogs exhibit to survive are quite shocking! The African Bullfrog will eat its own tadpoles for nourishment as it guards them and the froglets often eat their smaller siblings! The male Amazon Milk Frog will court two mates. The first female he attracts to his water-filled tree hollow will lay her eggs and he will fertilize them, while the next female is tricked into laying her eggs for him. He leaves the second batch of eggs unfertilized and they become food for he and his first mate’s offspring.
How do Frogs Communicate?

Frogs were the first land animals with vocal cords – they have been singing for 180 million years. With its mouth closed, a frog pumps air back and forth across its vocal cords. Many male frogs have vocal sacs - pouches of skin that fill with air. These balloons resonate sounds like a megaphone, and some frog choruses can be heard from a mile away. ix

**HOW DO FROGS USE THEIR SENSES?**

**Hearing:** Most frogs have excellent hearing, but cannot hear the highest or lowest sounds that humans hear. A frog’s eardrum, or tympanum, is on the outside of its body just behind the eye. The size of the eardrums and the distance between them determine which sounds a frog hears best. To protect its sensitive ears, a frog may produce special vibrations in its body to partly block the sound of its own loud call.x

**Sight:** Eyes positioned atop the head give frogs a field of vision of almost 180 degrees. This peripheral vision helps them spot predators and prey. Humans and other mammals focus images by changing the shape of the lens. Like a camera lens, frog eyes focus by moving the lens back and forth.xi

**Smell:** Olfaction, a sense of smell, in frogs is mainly used as a homing tool or recognizing breeding areas, but not often for detecting food. Many frogs can sense chemical changes in the air, not just from the nostril but from molecules collected on their eyes and skin. Many tadpoles use picking up chemical 'scents' to detect predators and food. And learning the chemical smell of the pool they were born in, to return to later as frogs to breed. Frogs nostrils are primarily for breathing through rather than smell as they breathe with their mouths shut. Frogs have a smell organ in the roof of their mouths called the Jacobson’s organ. This detects food. Sometimes frogs will open and close their mouths to try and locate food.xii

**Taste:** Frogs and Toads aren't very fussy eaters but will occasionally reject food that isn't right. They can sense the four basic tastes, bitter, sweet, sour and salty. This helps them reject unwanted matter they may have got in their mouths whilst feeding, or poisonous insects.xiii

**Touch:** Frogs use touch to help them survive in their habitat. The toe-pads of most tree frogs are covered with tubular cells standing on end. These tiny bristles compress and bend under pressure, allowing a toe-pad to “form-fit” over irregular surfaces. Mucous on the tips of the bristles allow them to stick to almost anything. Most tree frogs can climb straight up trees, cling to the underside of leaves, or hang preposterously from a branch by one toe.xiv

![Borneo eared frog](image-url)
ADAPTATION TO ENVIRONMENT

Many species of frogs have physical traits that evolved over time to give them an advantage for survival in their environment. These traits or specialized qualities help the animals overcome extreme climate and environmental changes. Genetic traits can help species camouflage themselves, or they can determine something like what layer of the ecosystem the frog can live. Look up in the trees or down on the ground to spot different species of frogs with unique traits. We call the distinctive match of a species trait to fit in a specialized climate or environment adaption.

Some frogs live in dry savannahs and scorching deserts. They survive long dry periods by limiting water loss and hiding from heat. During this aestivation, many cover themselves in a cocoon of dead skin. Others give themselves a rubdown with a waxy secretion. But most desert frogs hide from heat by going underground - sometimes for years. Spadefoot toads are expert diggers – their shovel-like feet allow them to dig as much as 6 feet beneath the surface. During dry periods, African bullfrogs cover themselves in up to 36 layers of dead skin. This parchment-like cocoon reduces water loss by 50 percent. Water-holding frogs from Australia store water in their bladders during dry periods. Aboriginal people sometimes harvest this water by sticking the back end of a frog into their mouths and squeezing.\textsuperscript{xv}

Make like a Leaf

These secretive frogs are leaf mimics. The pointed snout, projections over the eyes, and rigid “veins” running down the back help them disappear among leaf litter on the forest floor. The frogs lie motionless and ambush unsuspecting prey, including insects, spiders, crabs, scorpions, lizards and other frogs.\textsuperscript{xvi}
Poisonous Frogs

There are other traits that frogs have adapted that help them survive and function in their environment. Most frogs produce skin toxins, but the dart poison frogs from Central and South America are the most potent of all. One dart frog called *terribilis* (terrible frog) is so toxic that even touching it can be dangerous. A single *terribilis* contains enough poison to kill 20,000 mice or 10 people. It is probably the most poisonous animal on Earth.xvii

What is the function for such poison besides warding off predators? These chemicals help protect the very delicate skin of the frog from the growth of fungi and bacteria that would kill the frog. Although these toxins are very harmful to humans, scientists have found value in studying their secretions. Some of the chemicals produced by frogs are nearly identical to those that regulate our muscles and nerves while others are powerful pain killers. Researchers believe these secretions may one day be able to treat:

- Heart ailments
- Bacterial and viral infections
- Skin and colon cancers
- Depression, stroke
- Alzheimer’s disease
- Chronic pain xviii
How does the shape of a frog relate to locomotion?

The shape of a frog’s body is directly connected to how it moves. Frogs have short bodies, small thin arms and many species have big & powerful hind legs in proportion to their body. How do you think a bullfrog moves? Does it move like a dog? No, dogs have arms and legs that allow it to run and walk on all four feet. So how does a frog move? Because of the shape of its body the bullfrog uses its hind legs to propel itself forward. Frogs move in many ways, but that relates to its shape. Some hop on the ground, some crawl or even glide from limb to limb, and some spend most of their time swimming in a pond. Depending if the frog swims, crawls, glides, or hops it may have other specific traits that help it move in its habitat.

Although no frogs can truly fly, gliding frogs can soar and land gracefully from daunting heights. Their winged feet allow them to bank and steer through the air, and adhesive toe pads help them stick where they land.

The African Clawed frogs (Xenopus laevis) have powerful legs for swimming and lunging after food. They also use the claws on their feet to tear pieces of large food.xx

Other Unique & Weird Frog Structure & Function Facts

- When a frog swallows food, it pulls its eyes down into the roof of its mouth. The eyes help push the food down its throat. xx
- Many poisonous frogs are boldly colored as an advertisement that they are not good to eat. But some colorful frogs do not have particularly toxic skins. These imposters gain protection from birds and other predators by looking dangerous.xxi
- Frogs don’t just wear their skin, they drink and breathe through it, too! Many frogs even have a special drink patch on the underside of the body. Like a giant lung, the thin, moist skin allows gases to pass through, helping the frog to breathe. To keep the skin working well, frogs must stay clean and moist. They produce sticky mucus to prevent drying. Most frogs shed the outer layer of skin by twisting and stretching – they often eat the dead skin as it comes off.xxii
- Like fish, almost all frogs fertilize the eggs on the outside. The frog fertilizes the eggs as the female lays them.xxx
HABITATS, ECOSYSTEMS & ENERGY

Habbits

Frogs live almost everywhere - from tropical forests to frozen tundra and scorching deserts. They sport an amazing range of survival strategies. Habitat refers to the natural home or environment of an animal, plant, or other organism. Frogs live in many different habitats around the world. Depending on frog’s habitat they use different parts of their body to survive and hunt food.

Where do they live?

Waxy Monkey Frog

Vietnamese Mossy Frog

How and where do Frogs live? Ask students to observe two different animals.

Here I am comparing the Giant Waxy Monkey Frog and the Vietnamese Mossy Frog. What can students infer about the relationship between body and form and where in habitat would each animal live?

Possible Inferences: Giant Waxy Monkey Frogs are tree dwellers. They have sticky toes. Vietnamese Mossy Frogs are ground dwellers. They have textured skin that allows them to hide in moss that grows on the ground.
Ecosystems

An ecosystem is a biological community of interacting organisms and their physical environment. Humans have made unnatural changes in the earth’s ecosystem planet wide. These changes are often harmful to the health and wellbeing of all living things. Pollution or harmful products introduced in the environment, over collection of wild frogs like the endangered Tomato Frog, habitat destruction from deforestation, human introduction of invasive species, disease and climate change have all played a role in the destruction of the frog’s ecosystems worldwide.

Why are Frogs Important to our Ecosystems?

Frogs eat untold billions of insects each year making them economically valuable to agriculture. They also provide a critical food source as prey for birds, fish, snakes, and other wildlife. But the most important contribution frogs make may be their role as environmental indicators. When pollution or other environmental changes affect a habitat, frogs are often the first casualties. These delicate creatures provide an early warning for endangered ecosystems.xxv

Metabolism

Some frogs live high on mountain slopes or in the frigid North. During winter, a frog’s body temperature falls and its metabolism drops – the heart may even stop beating. Many frogs dig into mud or deep holes to escape killing frost, but some practice controlled freezing. They produce excess sugars or starches to prevent damage to sensitive tissues while the remaining water in their bodies turns to ice. The North American wood frog can survive with 65% of the water in its body frozen!xxvi

What do Frogs Eat?

Frogs are carnivorous, and will eat things such as: fruit flies, dragonflies, mosquitoes, wood lice, and crickets. Most frogs have short, pointed teeth for gripping prey. But "true toads” in the family Bufonidae, have no teeth at all. These bold predators catch prey with their sticky tongues and swallow it alive. Some large toads eat almost anything they can fit in their mouths, including mice, birds, snakes, and other frogs.xxvii
CONSERVATION

Many frogs are more colorful than the most dazzling birds, and their voices have filled the night with song since the dawn of the dinosaurs. But the chorus is fading. As humans change natural environments, frogs around the world are becoming extinct or are disappearing forever.\textsuperscript{xviii}

**Project Golden Frog**

A newly discovered fungal disease is spreading throughout many regions of the world, killing virtually all amphibians in its path. In Central America, the "death wave" will soon reach the Panamanian golden frog’s limited range. Project Golden Frog is an international cooperative effort to prevent the frog’s extinction. Major funding for this project has been provided through the American Zoo and Aquarium Association (AZA) and several of its member institutions.\textsuperscript{xxix}

**What can we do to help?**

We can make better efforts to protect frog habitats. Many frogs are disappearing as their homes are being destroyed by humans. We bring animals from one ecosystem to a new environment as \textit{introduced species}. Sometimes we transport them to these new habitats intentionally and other times we accidentally bring new animals into places where they do not already naturally exist. This can cause harm. We call \textit{non-native} species that disrupt their new natural habitats \textit{invasive species}.

**Green Invaders (American Bullfrog)**

More than a century ago, American bullfrogs were introduced into the western United States in hopes that they could be farmed for food. Although the farming efforts failed, the bullfrog adapted to man-made ponds and waterways and is now a threat to native species of fish, snakes, birds, and other frogs – some of them endangered.\textsuperscript{xxx}

**Frogs in Our Throats**

Since the dawn of humanity, frogs have been on our dinner plates, and they still provide an important food source for some developing countries. Frog legs have become a trendy delicacy in wealthy countries. Every day, tons of wild frogs are caught and shipped to restaurants around the world. Americans import 1.25 million pounds of frog legs each year and wild populations cannot keep pace with the slaughter.\textsuperscript{xxxi} We can consider other food options to help with the problem.

(photo from Recipes.com)
The Fading Chorus

Over the past 50 years scientists have recorded major declines in frog populations around the world. A few species have vanished completely. Many frog die-offs are the result of local human activity, but the epidemic has also reached remote areas. Is there a global cause? Scientists continue to search for answers.

Major causes of frog declines:

- Habitat destruction
- Introduced species
- Chemical pollution
- Climate changes
- Over-collection
- Epidemic diseases

Frogs with extra or missing legs, eyes, and toes have been found in 44 states since 1996. Possible causes include parasites, pollution, and ultraviolet radiation.

In a laboratory study in 1997, nearly half of the frog eggs exposed to ultraviolet light grew into malformed adults, while eggs with no exposure developed into normal adults.
FROGS EDUCATOR GUIDE VOCABULARY

Evolution: the process by which different kinds of living organisms are thought to have developed and diversified from earlier forms during the history of the earth.

Ecosystem: a biological community of interacting organisms and their physical environment.

Habitat: the natural home or environment of an animal, plant, or other organism.

Environment: the surroundings or conditions in which a person, animal, or plant lives or operates.

Organism: any form of life, we can generally group all organisms as plant or animal

Predator: any organism that exists by preying upon other organisms

Prey: an animal hunted or seized by another animal for food

Species: a group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding. The species is the principal natural taxonomic unit, ranking below a genus and denoted by a Latin binomial

Traits: a distinguishing quality or characteristic, in biological classification these typically belong to all animals of the same species.

Endangered Species: a species whose numbers are so small that the species is at risk of extinction

Introduced species: a species introduced either accidentally or deliberately by human actions into places beyond its natural geographical range.

Invasive Species: non-native species that disrupt by a dominant colonization of a particular habitat or from loss of natural controls

Life-cycle: the series of changes in the life of an organism, including reproduction.

Tadpole: the tailed aquatic larva of an amphibian (frog, toad, newt, or salamander), breathing through gills and lacking legs until its later stages of development.

Egg: the female reproductive cell in animals and plants; an ovum.

Froglet: a tiny frog that has recently developed from a tadpole.

Metamorphosis: (in an insect or amphibian) the process of transformation from an immature form to an adult form in two or more distinct stages.

Behavior: the way in which an animal or person acts in response to a particular situation or stimulus.

Adaption: a change or the process of change by which an organism or species becomes better suited to its environment.

Metabolism: the chemical processes that occur within a living organism in order to maintain life.

Energy: the capacity for vigorous activity; available power

Pollution: the introduction of harmful substances or products into the environment
Amphibian: any cold-blooded vertebrate of the class Amphibia, comprising frogs and toads, newts and salamanders, and caecilians, the larvae being typically aquatic, breathing by gills, and the adults being typically semi-terrestrial, breathing by lungs and through the moist glandular skin

Aestivation: to pass the summer or dry season in a dormant condition

Camouflage: concealment by some means that alters or obscures the appearance.

Conservation: prevention of injury, decay, waste, or loss; preservation

GENERAL CURRICULUM FIT

- Kindergarten Animal Classification
- Organization of Plants and Animals
- Survival of Plants and Animals
- Traits of Organisms
- Study of Ecosystems
- Study of Lifecycles

Questions to ask students during their visit

Discussion on, “What is a frog?”

What is an amphibian? Name all the features of that frogs have in common. (We will discuss difference once we get to habitats)

Discussion on Lifecycle:

What are the different stages of a frog’s life?

How do their behaviors change throughout their life? What do they eat? Where do they live?

Discussion on Habitats:

Point to a frog and have kids tell you what it looks like (Size, color, body shape etc.)

Ask them if they think any of these traits have adapted over time due to the frog’s habitat?

What is the relationship between structure and function? (Ex. Tree frogs have the ability to stick to surfaces and this helps them survive in trees.)

List the different types of habitats there are in the world?

How many species are there?
Wrap up your tour or visit with these questions:

How do frogs protect themselves?

How do their traits relate to how they move in habitat? Hop, glide, stick etc.

Do you think frogs are important to us and the planet? How?

What is frog conservation and why is this popular movement across the planet?

What can we do to help?

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BACK IN THE CLASSROOM
(Video Clips, Sounds to Explore, & More)

- Visit this link at National Geographic Explorer to learn more About the American Bull Frog. http://video.nationalgeographic.com/video/animals/amphibians-animals/frogs-and-toads/frog_bull/
- Visit this link to hear the unique sound of a Smokey Jungle Frog. http://www.bbc.co.uk/nature/life/Smoky_Jungle_Frog
- Visit this link to research frogs in general. (easy to use) http://allaboutfrogs.org/weird/weird.html
- Visit this link to research frogs in Michigan http://michigan.gov/dnr/0,4570,7-153-10370_12145_12201-35089--.00.html#winter

Cladogram illustrating animal relationships (includes frogs)

- To explore a map of living things and their general categorization; visit the American Museum of Natural History’s “Hall of Biodiversity” interactive tour http://www.amnh.org/exhibitions/hall_tour/spectrum/flash/

Learn more about Amphibians at AmphibiaWeb http://www.amphibiaweb.org/index.html

Post- Exhibit Discussion

- Ask students to share what they learned from the exhibition.
- Discuss the diversity of frog behavior, structure and function, and habitat. Ask them what behavior or adaption amazed them most and why? What other animals have similar adoptions or demonstrate similar behavior?
- Ask students to compare and contrast ways in which humans and frogs sense their environment.
- Do frogs use senses different than humans? How do our senses help us find food?
Ideas for Research Assignments:

Lifecycle Project: (elementary school)

*Pick a frog to study as a class or assign students to a group to study one type of frog. Go on the web to research the frogs. If the older students have media access let them complete this task in groups. For younger students the teacher should help the students find the information.

* Have students list the different stages in a frog’s life together. Kindergarten through 3rd grade teachers should list on the board. 4th grade and up should be able to work in groups.

* Have student’s list details about the frog in all the stages of its life.

<table>
<thead>
<tr>
<th>stage</th>
<th>describe animal shape</th>
<th>location</th>
<th>food</th>
</tr>
</thead>
<tbody>
<tr>
<td>egg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tadpole</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tadpole with legs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Froglet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>frog</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Assign students to make a card for each stage of the frog’s life, draw the animal in its habitat on one side of the card and then list the notes you all took as a class or group on the back of each card that corresponds to the stage.

Diorama Project:

Have students design a diorama for a frog species of their choice. Have students write a small paper to identify the frog and some of the other living organisms in their creation.

*List the other animals that may live with the frog.

* List some of the plants in the diorama.

* List what the animals eat.

* List unique traits the animal has & how they help the animal survive.

*If the animal has unique behaviors include those details. How does the animal behave and why? (Ex. What is the purpose for a fire belly toad to flash animals that approach it?)

*Have students generate a paragraph detailing activities that are harmful to the species they are researching. Follow up with a paragraph exploring a list of activities that we can do to help the problem.
**Power Point or Research Card Project:**

Assign students to research the diversity of frogs in Michigan or the exhibition. Students can look up native species of Michigan at Michigan.gov’s Department of Natural Resources website.

Michigan students can visit: [http://michigan.gov/dnr/0,4570,7-153-10370_12145_12201-35089--,00.html#species](http://michigan.gov/dnr/0,4570,7-153-10370_12145_12201-35089--,00.html#species)

This resource is great if they choose to focus on Michigan frogs or they can visit the American Museum of Natural History, Frogs a Chorus of Colors Exhibition Overview to research (frogs from around the world) frogs viewed on their visit. [http://www.amnh.org/exhibitions/current-exhibitions/frogs-a-chorus-of-colors](http://www.amnh.org/exhibitions/current-exhibitions/frogs-a-chorus-of-colors)

You may want to assign them to make a Power Point on Frog Conservation if your students have enough access in your media center for this project. If the students are younger and/ or do not have access to the media center they can make half page cards where they can draw the frogs.

*Have students identify the species on each slide or card

* List what the animals eat.

* List unique traits the animal has & how they help the animal survive.

*If the animal has unique behaviors include those details. How does the animal behave and why? (Ex. What is the purpose for a fire belly toad to flash animals that approach it?)

*Have students generate a list of activities that are harmful to the species they are researching. Follow up with a list of activities that we can do to help the problem. (This would be a second slide or the backside of the cards.)

**Conservation Activity: How to Build a Toad House**

Visit the Department of Natural Resources to print this fun activity to do with your students.

[http://michigan.gov/dnr/0,4570,7-153-10370_12148-60160--,00.html](http://michigan.gov/dnr/0,4570,7-153-10370_12148-60160--,00.html)
Exhibition Journal Activity

Pick your favorite enclosure and study it like a scientist.

In this enclosure how many animals do you count? ________________________

Look at the enclosure text panels and list what species live in this habitat:

________________________

________________________

________________________

________________________

Scientific Observation: Pick an animal to observe & take notes:

<table>
<thead>
<tr>
<th>(species) animal name</th>
<th>List colors &amp; patterns animal</th>
<th>List actions / behavior</th>
<th>List the location: Is it up in a tree or on the ground?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

Scientific Observation: Study this habitat as an ecosystem. Observe what types of plants that you see.

<table>
<thead>
<tr>
<th>Plant type: Look at a plant &amp; categorize it. Ex. types: tree, fern, moss or is it leafy foliage?</th>
<th>Describe colors &amp; patterns on the plant: stripes, spots, no pattern with one color?</th>
<th>Describe location: List if it grows on top, bottom or the sides of case.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td></td>
<td>Type:</td>
</tr>
</tbody>
</table>

In the exhibit enclosures the frogs have a unique habitat that fits their needs. List some of the other items inside the enclosure that make this habitat like an ecosystem. Do you spot examples of food, water or light?
Draw the enclosure / **habitat** of your choice. Be sure to include the details of the patterns you see on each plant & animal; use your notes from the first page to help you sketch.
References

1. What is a Frog, anyway?
2. Pollywogs (Tadpoles)
3. kiddyhouse.com
4. From Fins to Four Legs
5. FLashers
6. Sit and Wait Predator (Horned frog)
7. Mean Green Eating Machine (African Bullfrog)
8. Just a Gigolo (Amazon Milk Frog)
9. Swamp Symphonies
10. What Big Ears
11. Frog Eyes
14. Sticky fingers
15. Frog without a pond
16. Make Like a Leaf
17. Don’t Kiss These Frogs (Dart poison frog)
18. Hopping Drugstores
20. Frog Eyes
21. If Looks Could Kill
22. Thin Skin
23. The Mating Embrace
24. Amazing Adaptable Frog
25. What are Frogs Worth
26. Frog Anti-freeze
27. Toothless Predator & Ask.com
28. Amazing Adaptable Frog
29. Project Golden Frog
30. Green Invaders (American BullFrog)
31. Frogs in Our Throats
32. The Fading Chorus