Michigan Nature Association

Protecting Michigan's Natural Heritage Since 1952

www.michigannature.org 517-655-5655

Frog-Tastic

Written By: Joan Chadde Edited By: Phil Bergquist

Learning Objectives:

At the end of the lesson participants will be able to:

1. Understand why frogs call in spring and if they all call at the same time.
2. Describe 4 stages of frog life cycle
3. List 5 ways that tadpoles are different from frogs
4. Explain why frogs are beneficial
5. Explain why frogs are bioindicators of environmental quality
6. Compare habitat requirements for a tadpole and an adult frog.
7. Describe 3 ways that frogs and toads are similar and 3 ways that they are different.
8. Explain how to safely "research" frogs and toads.

Materials Needed

Frog metamorphosis poster
Michigan Frogs & Toads poster
Frog pictures
Frog shakers (film canisters)
Frog calling materials (rocks, balloons, combs, jingling bells, rubber band/cups)
Eat or Be Eaten at the Wetland Café poster

Frog Ecology & Behavior

Spring is a time birth and change....here are some of the signs on Spring:

- First bird singing
- See first bird - robin
- First frog calling
- First thunderstorm
- First bumble bee
- First mosquito
- Ice melts off lakes
- First flower
- First butterfly
- First leaf (swelling of buds)

What tells us Spring is here? - The air is warmer
- Water is warmer
- The day is longer/ more sun
- HEARING FROGS!!!

Today we are going to learn more about frogs; why and when they call, what their calls sound like, why frogs go through metamorphosis, how tadpoles are different from frogs, and explore what lives in a pond along with the tadpoles and frogs.

There are 13 species of frogs in Michigan:

Blanchard's Cricket Frog

Bull Frog

Gray Tree Frog

Eastern American Toad

Fowler's Toad

Green Frog

Mink Frog

Northern Leopard Frog

Northern Spring Peeper

Pickerel Frog

Western Chorus Frog

Wood Frog

Boreal Chorus Frog

Why do frogs call?

- To attract a mate
- Warn away other males from their breeding site
- Warn of danger

Activity: Frog Matching- Sound

Fill film canisters with a variety of materials such as paper clips, sand, pebbles, beans etc., and make two of each kind (a pair). Each participant shakes their canister and must listen to find their partner. (the person who has a film canister with the same sound, i.e. the same material inside).

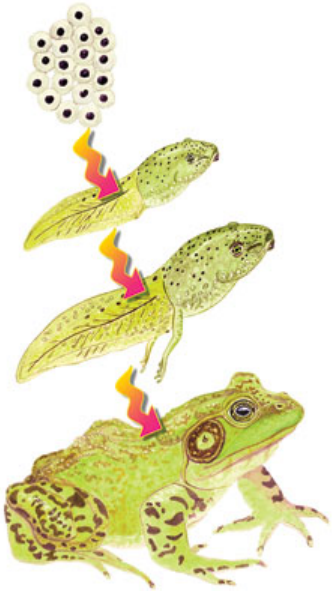
Do all frog species sound the same? *No!*

How do breeding frogs find a mate? *By sound.*

Activity: Frog Chorus

Break up into groups of 3-4 people (or smaller is there are less people) to be the various species of frogs.
Teach them their "call" using the props provided (rocks, balloons, etc.).

See the Frog Calling Calendar and direct the participants to start their call based on when they start and end in the calendar year. Arrange students in a circle. You will be the "conductor" telling each species when to begin and end their calling.



What do you observe about the calling of frogs? Do they all call at once in the spring? No!

Do they all call for the same period of time? *No! Wood frogs call for the shortest period and spring peepers call for the longest period.*

Overview of Frog Life Cycle

1. Egg (hatch in few days or weeks, depending upon temperature & species)

2. Tadpole (for weeks, months or entire year)

3. Metamorphosis

4. Froglet

5. Adult frog

Why metamorphosis?

Metamorphosis is the change that takes place inside and outside of an animal or insect. These changes happen for one important reason––to prepare it for a change in *where and how* it lives. Metamorphosis = double life. Metamorphosis allows larvae and adults to live in different places and eat different things, so that they ***don't compete*** with each other for living space, shelter, or food. Compare to human children & adults. Do we go through metamorphosis?

Frog or Tadpole?

Characteristics of Tadpoles

1. Swim like fish using tail to move through water; no legs.
2. Have gills to breathe oxygen in water
3. Fish-like mouth opening
4. Feed on algae and plant life

Characteristics of Frogs

1. Mouth changes from fish-like opening to mouth with tongue
2. Have lungs that breathe oxygen out of air
3. Digestive systems changes to eat insects and small animals
4. Tail is absorbed (used for energy, while mouth is sealed shut as it metamorphoses)
5. First hind legs then front legs appear that allow them to move on land by hopping or leaping---no longer restricted to only living in water.

Activity: Play *Moving Meals* (just like Red Light, Green Light)

Assign two participants to be frogs and position them at one end of the pond. The other people are mosquitoes and other insects that have to fly across the pond without getting eaten by the adult frogs. Students love the running and excitement of this game.

Benefits of Frogs

- Provide food for other animals: many frog eggs, tadpoles, froglets, and frogs become food for other animals like birds, snakes, skunks, herons, other frogs, aquatic insects, etc.

- EAT insects – 4800 per year!

Activity: Frog Sampling

Now that you have learned more about frogs you can go visit them in their habitat...but you have to follow the rules:

1. This pond is home to lots of animals.
Treat the pond the way you'd want a stranger to treat <u>your</u> special place. Don't walk in it! It makes the water all murky— hard for us to see critters and hard for them to see their food.

2. This pond is a nursery for young animals.
Be careful with the animals that you collect so you don't injure them.
- *Don't handle them with your hands.*
- *Put all animals back in the water when you are through.*

3. These animals need water.
All collected animals must be placed in a container with water ASAP.

4. Be careful of equipment.
Rinse all nets and containers when you're through.

5. Don't use mosquito repellant on your hands

6. Always return to the same pond from which you got the tadpoles and frogs to avoid spreading exotic species and disease.

Remember to wear boots; a net with very small holes and a 5-gallon bucket will be your best tools.

Test What You Learned!

1. Why do frogs call in spring? Do they all call at the same time?
2. Describe 4 stages of frog life cycle (metamorphosis, amphibians).
3. List 5 ways that tadpoles are different from frogs.
4. Explain why frogs are beneficial?
5. Explain how to safely "research" frogs and toads

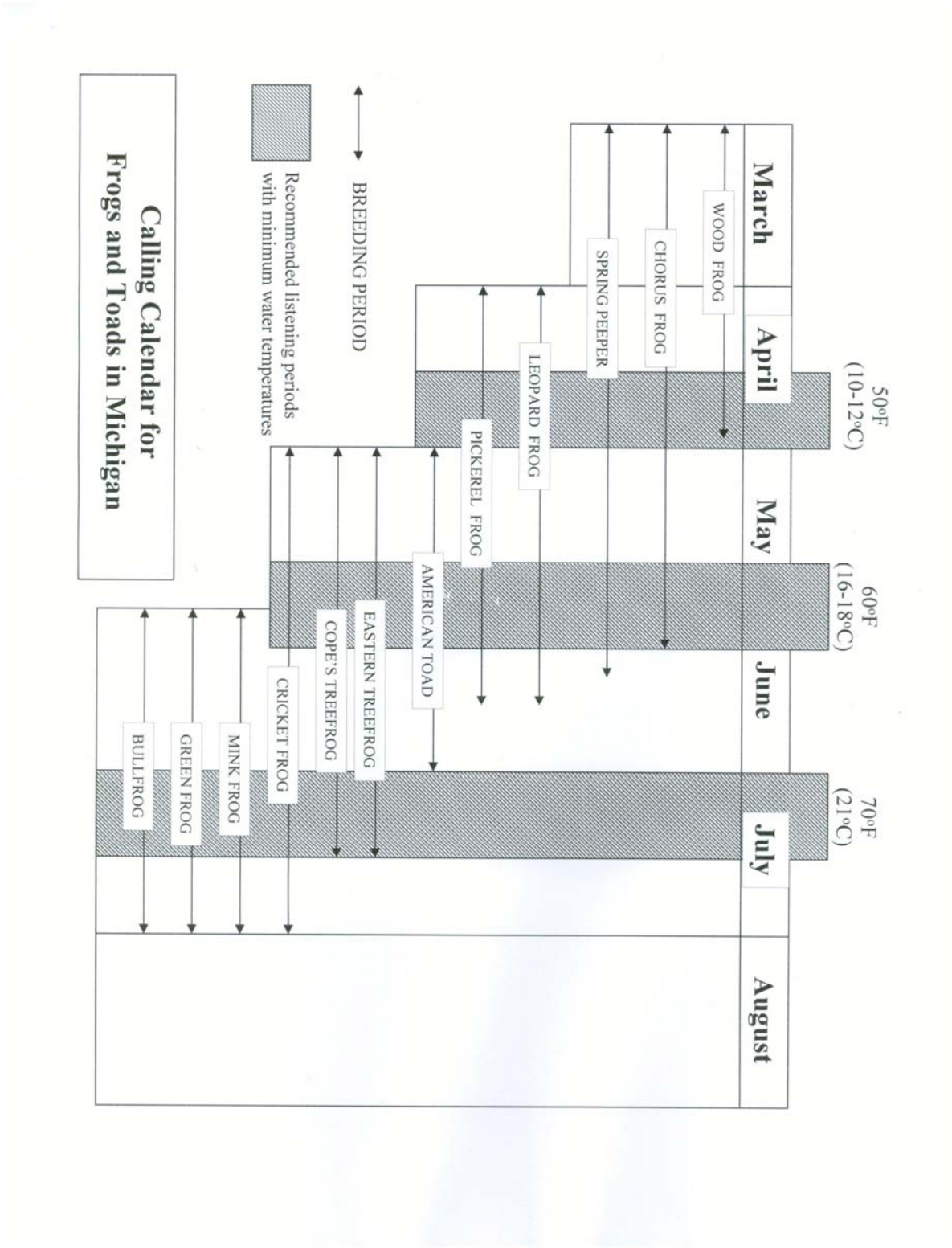
At Home you can take the Frog Calling Quiz: http://www.pwrc.usgs.gov/frogquiz/

You can also participate in the Michigan Frog and Toad Survey
http://www.michigan.gov/dnr/0,1607,7-153-10370_12143_12194---,00.html

Michigan Frog Songs

1. Wood Frog	Hoarse quacking with little carrying power
2. Western Chorus Frog (Boreal Frog is only found on Isle Royale)	"Crreek" lasts ½ to 2 seconds; similar to sound of fingernail running along fine-toothed comb.
3. Northern Spring peeper	High ascending "peep;" chorus resembles jingling of sleigh bells.
4. Northern Leopard Frog	Deep rattling snore interspersed with chuckling sound of thumb rubbing against balloon.
5. Pickerel Frog	Steady low-pitched snore with little carrying power, similar to Leopard Frog.
6. American Toad	Musical trill lasting up to 30 seconds, ends abruptly.
7. Eastern Gray Treefrog	Short, loud trill lasting up to one second.
8. Cope's Gray Treefrog	Short, loud trill lasting a half second or less; faster and harsher than Eastern Treefrog; nasally "wa-a-a-a"
9. Mink Frog	Likened to sound of horses' hooves on a cobblestone street.
10. Green Frog	Similar to the twang of a loose banjo string or large rubberband; usually given as a single note.
11. Bullfrog	Deep bass notes, similar to a foghorn.

Michigan Frog Song Calendar



Sources

Lingelbach, Jenepher. Hands-On Nature. Vermont Institute of Science. Woodstock, Vt. 1986, 2000. P. 58-63.

Harding, Jim and J. Alan Holman. 1992. Michigan Frogs, Toads and Salamanders.
Michigan State University Extension.

http://www.michigan.gov/dnr/0,1607,7-153-10370_12143_12194-35089--,00.html

Photos taken by Jim Harding